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A LIST OF THE SHRUBS OF LOUISIANA

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Just as in the list of trees of Louisiana, published in this journal April 1921, this catalogue is based almost entirely on the collections of the writer during the past sixteen years. Shrubs which occasionally become arborescent have already been catalogued in the list of trees and are not listed again here. The date of flowering has been given in most cases and is always the earliest date on which the plant was found in bloom. While it is believed that the list of shrubs is fairly complete, there is much still to find out regarding their distribution in the State. A few shrubs have been included, specimens of which were collected in 1840 by Dr. Josiah Hale, of Alexandria, and deposited in the herbarium of the new Orleans Academy of Sciences, the remains of which are now in the herbarium of Tulane University. A few have also been included on the authority of Dr. J. K. Small in his *Flora of the Southern States*, second edition. In addition to the specimens in Tulane University herbarium, specimens of almost all of the shrubs are in the Arnold Arboretum. As in the case of the trees Professor Sargent has revised the identifications. In some unaccountable manner, in the list of trees, the Live Oak, the best known tree in Louisiana, was omitted and is included here.

PALMACEAE.

Sabal glabra (Mill.) Sarg. (*S. Adansonii* Guerns.) In swampy ground over the whole State. Flowers April 20. Fruit July.

Serenoa serrulata (Michx.) Hook. f. Dry pine barrens and sandy soil, Washington and St. Tammany Parishes. Flowers May 5. Fruit July.

LILIACEAE.

Smilax hispida Muhl. Dry and wet woods everywhere. Flowers April 3. Fruit June.

Smilax pumila Walt. In dry woods over the whole State. Flowers April 15.

Smilax rotundifolia L. Common everywhere in woods and along fences. Flowers April 15. Fruit July.

Smilax bona-nox L. In woods and along streams. Common. Flowers April 15.

Smilax laurifolia L. In damp woods and along streams; over the whole State. Used largely for Christmas decorations. Flowers June 25. Fruit September.

Smilax Walteri Pursh. Very common on edges of cypress swamps, sometimes retaining the red berries all the winter.

Smilax lanceolata L. In woods, Washington Parish. Flowers June 15.

MYRICACEAE.

Myrica cerifera var. *pumila* Michx. Open pine woods and pine barrens, Tangipahoa, St. Tammany and Washington Parishes. Flowers March 5. Fruit May.

Myrica carolinensis Mill. Along streams in the pine barrens. East Louisiana. Flowers March 15. Fruit June.

Myrica inodora Bartram. Along streams in pine barrens, Washington Parish. Flowers February 25. Fruit June.

BETULACEAE.

Alnus rugosa (Du Roi) K. Koch (*A. serrulata* Willd.) Along streams over the whole State. Sometimes arborescent, reaching a height of 30 feet or more. Flowers February 25.

FAGACEAE.

Castanea nana Muhl. Sand hills and pine barrens forming wide patches, Louisiana; on authority of Small, *Flora*, ed. 2, p. 348.

LORANTHACEAE.

Phoradendron flavescens (Pursh) Nutt. All over the State on many kinds of trees.

POLYGONACEAE.

Brunnichia cirrhosa Gaertn. Moist woods and borders of cypress swamps over the whole State. Flowers April 2.

MENISPERMACEAE.

Cocculus carolinus (L.) D. C. Banks of rivers and borders of swamps over the whole State. Berries very showy and often retained the whole winter. Flowers May 2. Fruit September.

Menispermum canadense L. Banks of rivers and rich woods. West Feliciana and Washington Parishes. Fruit September.

Calycocarpum Lyoni (Pursh) Nutt. Borders of streams and edges of wet woods. West Feliciana Parish. Flowers April 15. Fruit September.

MAGNOLIACEAE.

Illicium floridanum Ellis. Rolling hills and along streams in pine barrens. East Louisiana. Most abundant in Tangipahoa, St. Tammany and Washington Parishes. Flowers February 25. Fruit May.

ANONACEAE.

Asimina parviflora (Michx.) Dunal. Partly cleared woods and dry fields. Pearl River, St. Tammany Parish, Opelousas, St. Landry Parish, and Avery Island, Iberia Parish. Flowers April 10. Fruit July.

LAURACEAE.

Benzoin aestivale (L.) Nees. Rich woods, West Feliciana Parish, also borders of swamps across the Mississippi River from New Orleans. Flowers April 1. Fruit June.

Litsea geniculata (Walt.) Benth. & Hook. Shallow ponds, Louisiana; on authority of Small, *Flora*, ed. 2, p. 823.

SAXIFRAGACEAE.

Hydrangea arborescens L. Ravines and borders of streams. West Feliciana, St. Tammany and Washington Parishes. Flowers May 15.

Hydrangea quercifolia Bartram. In dry woods. West Feliciana, Washington, also Richland Parish. Flowers May 25.

Decumaria barbara L. Rich woods West Feliciana, Washington and Tangipahoa Parishes. Flowers April 20. Fruit July.

Philadelphus grandiflorus Willd. Collected by Hale near Alexandria, Rapides Parish; probably an escape. Frequently planted in gardens and more or less naturalized.

Itea virginica L. Swamps and river banks over the State. Flowers April 15.

Grossularia campestris Small. Red River, Avoyelles Parish. Hale, Louisiana, 1840 in herb. Columbia University.

ROSACEAE.

Spiraea salicifolia L. Collected by Hale in 1840 near Alexandria, Rapides Parish.

Rubus villosus Ait. (*R. procumbens* Muhl.) Cultivated ground over the State. Flowers February 20. Fruit May.

Rubus floridus Tratt. Sandy ground, Natchitoches Parish (E. J. Palmer, No. 7208). April 15.

Rubus carpinifolius Rydb. Low wet woods, Rapides Parish and Natchitoches Parish. (E. J. Palmer, No. 7431). April 29.

Rubus cuneifolius Pursh. Sandy soil, St. Tammany Parish (G. Arsène).

Rubus rubrisetus Rydb. Sandy soil. Natchitoches Parish. (E. J. Palmer, No. 7431).

Rubus trivialis Michx. Waste ground over the State. March 15.

Rubus argutus Link (*R. Andrewsianus*, Blanchard). All over State borders of woods, roadsides. April 5.

Rubus ostryifolius Rydb. Near the coast, Louisiana; on authority of Small, *Flora*, p. 517.

Rosa carolina L. (*R. humilis* Marsh.) In dry woods over the State. April 10.

Rosa Lyonii Pursh. Woods near Natchitoches, Natchitoches Parish. (E. J. Palmer, Nos. 7960, 9428).

Rosa Treleasei Rydb. Alden Bridge, Bossier Parish; on authority of Rydberg in N. Am. Fl. xxii. 503.

Rosa bracteata Wendl. Widely naturalized over the State, in many places a most troublesome weed. Blooms all the year.

Rosa laevigata Michx. (*R. cherokeensis* Donn). Roadsides and fields. Often cultivated. April 10.

Chrysobalanus oblongifolius Michx. Dry pine barrens. Washington Parish, near Bogalusa. June 5.

Aronia arbutifolia L. In damp woods and along streams. St. Tammany Parish near Covington, Alexandria, Rapides Parish, De Ridder Beauregard Parish, and Washington Parish, near Bogalusa. March 3.

Aronia arbutifolia macrophylla (Hook.) Rehd. Along streams in pine barrens. Folsom, H. Tammany Parish. March 28.

CALYCANTHACEAE.

Calycanthus fertilis var. *nanus* (Lois.) Schelle. Dry woods near Bogalusa Washington Parish, and also near Ruston, Linclon Parish, north Louisiana. April 15.

Calycanthus floridus L. Collected by Hale near Alexandria, Rapides Parish, 1840; also near Monroe, Ouachita Parish.

LEGUMINOSAE.

Acacia Farnesiana Willd. Escaped and sometimes forming dense thickets in swampy ground near Lake Pontchartrain and in cleared fields.

Acacia angustissima (Mill.) Ktze. Natchitoches Parish (E. J. Palmer).

Prosopis juliflora var. *constricta* Sarg. Vicinity of Shreveport near the Red River, Caddo Parish.

Amorpha paniculata Torr. & Gr. Collected by Hale near Alexandria.

Amorpha fruticosa L. Along streams all over State. April 15.

Amorpha fruticosa var. *croceolanata* (Wats.) C. Schneid. Calcasieu Parish (A. Allison, No. 280); Orleans Parish (R. S. Cocks); Natchitoches Parish (E. J. Palmer, No. 7548).

Amorpha tennesseensis Shuttl. Louisiana; on the authority of Rydberg in N. Am. Fl. xxii. 32.

Amorpha canescens Pursh. Prairies of Louisiana; on the authority of Britton and Brown, Ill. Flora, ed. 2, ii. 366.

Wisteria macrostachya Nutt. Rich woods over the whole State. Flowers April 15.

Daubentonia longifolia (Cav.) D.C. In marshes and wet places over the State. Very abundant in vicinity of New Orleans, also near Lake Charles, Calcasieu Parish.

RUTACEAE.

Ptelea trifoliata L. Usually a shrub three or four feet high, occasionally in West Feliciana Parish, a small tree 30 feet high. Widely distrib-

uted over the State, sometimes very abundant in open fields and pastures. Flowers April 15. Fruit July.

Ptelea trifoliata var. *mollis* Curtis. In Louisiana a medium sized shrub. Very common in the western part of the State. Flowers April 15.

EUPHORBIACEAE.

Sebastiania ligustrina (Michx.) Muell. Arg. Banks of rivers over the whole State. Flowers April 2.

ANACARDIACEAE.

Rhus canadensis Marsh. Dry woods Natchitoches, Natchitoches Parish; Alexandria, Rapides Parish; Winnfield, Winn Parish. Flowers April 15.

Rhus Toxicodendron L. Woods, fields and on fences all over the State. Flowers March 5.

Rhus quercifolia (Michx.) Steud. Over the State. Flowers March 15. Fruit June.

CYRILLACEAE

Cyrilla racemiflora L. var. *parvifolia* (Raf.) Sarg. In swamps and streams, Louisiana; on authority of Small, Flora, ed. 2, p. 730.

AQUIFOLIACEAE.

Ilex myrtifolia Walt. Swamps and in wet pine barrens over State. Flowers April 3.

Ilex Amelanchier M. A. Curtis. Very rare in Louisiana, known only from one locality. Washington Parish near Bogalusa. Along streams. Flowers April 1. Fruit May.

Ilex caroliniana (Walt.) Trelease (*I. ambigua* Chapman). Sandy woods near Natchitoches (E. J. Palmer, No. 7433). April 29, 1915.

Ilex montana Torr. & Gr. (*I. monticola* A. Gray, *I. dubia* var. *monticola* Loes.) Washington Parish, Winn Parish near Winnfield quarries, also along streams, in West Feliciana Parish. April 10.

Ilex longipes Chapm. Rich woods, and along streams, West Feliciana Parish, Washington Parish near Bogalusa. April 5.

Ilex verticillata (L.). A. Gray. In wet places over the whole State. April 5.

Ilex glabra L. In pine barrens over the whole State. Often forming extensive thickets. Flowers March 6. Fruit June.

STAPHYLEACEAE.

Staphylea trifoliata L. Collected by Hale, near Alexandria, Rapides Parish, 1840. Not found by writer.

CELASTRACEAE.

Evonymus americana L. Rich woods. Covington, Clairborne Parish, East and West Feliciana Parishes, Lake Charles, Calcasien Parish. Flowers April 10. Fruit July.

Celastrus scandens L. Occurring in Louisiana only in West Feliciana Parish where it is common. Flowers April 25. Fruit September.

RHAMNACEAE.

Berchemia scandens (Hill) K. Koch. Moist woods over the whole State. Flowers April 1, Fruit August.

Zizyphus jujuba Mill. (*Z. sativa* Gaertn., *Z. vulgaris* Lam.) Escaped from cultivation and forming dense thickets near Bains, West Feliciana Parish. Flowers April 10.

Ceanothus americanus L. Dry woods, over the State. April 15.

Ceanothus intermedius Pursh. Pine woods, widely distributed over the State. April 15.

VITACEAE.

Vitis rupestris Scheele. Woods near Natchitoches, Natchitoches Parish (E. J. Palmer No. 8006).

Vitis cordifolia Lam. Woods and thickets over the whole State. Flowers April 1. Fruit September.

Vitis palmata Vahl. Rich wet woods Richland and West Feliciana Parishes, also near Natchitoches, Natchitoches Parish. Flowers April 3. Fruit September.

Vitis cinerea Engelm. Rich woods over the State. Flowers April 3. Fruit November.

Vitis Linsecomii Buckl. Dry oak lands, Louisiana; on authority of Small, Flora, p. 755.

Vitis tilifolia H. B. K. (*V. caribaea* D. C.) Sandy soil, Louisiana; on the authority of Small, Flora, p. 756.

Vitis rufotomentosa Small. Near Natchitoches, Natchitoches Parish (E. J. Palmer, No. 7974), and in woods, West Feliciana Parish. Flowers April 3. Fruit November.

Vitis aestivalis Michx. In rich woods. West Feliciana Parish. Flowers April 1. Fruit October.

Vitis candicans Englem. In swampy woods. Cameron Parish near the sea coast. Fruit June.

Vitis rotundifolia Michx. Rich woods over the whole State. Flowers April 2. Fruit August.

Ampelopsis cordata Michx. Borders of swamps and moist woods over the State. Flowers May 1. Fruit August.

Ampelopsis arborea (L.) Koehne. Moist woods and fields over the State. Flowers April 5. Fruit September.

Parthenocissus quinquefolia var. *hirsuta* Planch. and var. *Saint-Paulii* (Graebn) Rehd. In woods over the State. Flowers April 15. Fruit September.

Cissus incisa Desmoul. Very common near the sea coast on shores of Lake Pontchartrain. Flowers April 15.

TAMARICACEAE.

Tamarix gallica L. Extensively naturalized along the coast, frequently growing on sea beaches within the tide line. Very abundant in Cameron Parish at the mouth of Cameron River.

GUTTIFERAE.

Ascyrum stans Michx. In sandy soil. St. Tammany, Tangipahoa Parishes, also near Natchitoches, Natchitoches Parish. May 15.

Ascyrum multicaule Michx. Dry woods Shreveport, Caddo Parish, and over the whole State.

Ascyrum hypericoides L. Over the whole State. June 15.

Hypericum prolificum L. Borders of ponds. Shreveport.

Hypericum lobocarpum Gattinger. St. Tammany Parish, on banks of Chefuncte River. May 20.

Hypericum apocynifolium Small. Rich woods near Crowley, Acadia Parish. April 28.

Hypericum fasciculatum Lam. Pine barrens and dry woods over the State. April 10.

Hypericum nudiflorum Michx. Dry woods. Natchitoches Parish (E. J. Palmer, Nos. 7298, 7572, 8008, 8009). Alexandria, Rapides Parish. April 15.

Hypericum aspalathoides Willd. Sandy open ground, Chopin, Natchitoches Parish (E. J. Palmer, No. 7545). May 6.

THEACEAE.

Stewartia malacodendron L. In rolling woods, Tangipahoa, St. Tammany, Washington Parishes. May 5.

CORNACEAE.

Cornus stricta Lam. Borders of swamps over the State. April 10.

ERICACEAE.

Clethra alnifolia L. Along streams in pine barrens, St. Tammany, Tangipahoa, and Washington Parishes. April 20.

Clethra tomentosa Lam. Borders of ponds in pine barrens St. Tammany, Washington, Tangipahoa Parishes. Flowers June 25.

Rhododendron canescens Sweet (*Azalea canescens* Michx.) Over the whole State except alluvial soil and swamps. February 27.

Rhododendron canescens var. *subglabrum* Rehd. On wet sandy soil. Natchitoches, Calcasieu and East Baton Rouge Parishes.

Rhododendron serrulatum Millais (*Azalea serrulata* Small). Very rare, found only near Pearl River, St. Tammany Parish. June 15.

Leucothoe axillaris (Lam.) D. Don. In damp woods, Washington Parish near Bogalusa. April 10.

Leucothoe racemosa (L.) A. Gray. Very common in wet pine barrens and along streams.

Pieris lucida (Lam.) Rehd. (*Andromeda nitida* Bartr.) Wet pine barrens, very common over the whole State.

Lyonia ligustrina var. *foliosiflora* (Michx.) Fern. Swamps and low pine lands, Louisiana; on the authority of Small, *Flora*, ed. 2, p. 889. Not found by writer.

Gaylussacia dumosa (Andr.) Torr. & Gr. Sandy soil in pine barrens over the State. Flowers March 15. Fruit July.

Gaylussacia hirtella (Ait.) Klotzsch. Damp pine barrens, Washington and St. Tammany Parishes. Flowers March 15. Fruit July.

Gaylussacia frondosa (L.) Torr. & Gr. Swampy places in the pine barrens, St. Tammany and Tangipahoa Parishes.

Vaccinium virgatum Ait. In woods and along streams and on prairies over the whole State. Flowers April 15. Fruit July.

Vaccinium stamineum L. Rolling hills over the whole State. March 2. Fruit July.

Vaccinium vacillans Chapm. Rich swampy woods. Richland Parish. Flowers April 15.

Vaccinium tenellum Ait. In open pine woods over the whole State. Flowers February 28. Fruit June.

Vaccinium Elliottii Chapm. On rolling hills, West Feliciana and Winn Parishes; in pine woods over the whole State. Flowers March 3. Fruit June.

Vaccinium corymbosum L. Along streams in pine barrens. Folsom, St. Tammany Parish. Flowers April 6. Fruit July.

Vaccinium fuscum Ait. (*V. corymbosum* var. *fuscum* A. Gray). Swamps Louisiana; on authority of Small, *Flora*, ed. 2, p. 895.

Vaccinium melanocarpum Mohr. Dry open woods near Natchitoches, Natchitoches Parish. Flowers April 15. Fruit July.

Vaccinium myrsinites Lam. Pine lands, Louisiana; on authority of Rev. A. B. Langlois, *Catalogue of plants of Southern Louisiana*. 1887.

STYRACACEAE.

Styrax pulverulenta Michx. Wet pine barrens over the whole State. Flowers March 25.

Styrax americana Lam. Borders of swamps and along streams and bayous over the whole State. Flowers March 20.

LOGANIACEAE.

Gelsemium sempervirens L. Climbing to the tops of the highest trees. Especially common in wet pine woods over the State. February 20.

SOLANACEAE.

Capsicum baccatum L. Salt marshes near the beach, Cameron Parish. Introduced. Flowers August 15.

Lycium carolinianum Walt. In drifting sands along the sea coast and on the islands. Flowers July 3.

Lycium halimifolium Mill. (*L. vulgare* Dunal). Widely naturalized around Lake Charles. Flowers April 15.

Cestrum Parquii L'Hér. Common in waste ground in vicinity of New Orleans. Flowers April 15.

VERBENACEAE.

Callicarpa americana L. In woods everywhere throughout the State. Flowers April 15. Fruit July. Occasionally a form occurs with fruit white instead of pink.

Vitex Agnus-castus L. Widely naturalized in many parts of the State. Flowers in June.

BIGNONIACEAE.

Bignonia radicans L. Woods and fields everywhere. Flowers April to October.

Anisostichus capreolata (L.) Bur. Borders of swamps and wet woods over the whole State. Flowers April 1.

CAPRIFOLIACEAE.

Viburnum acerifolium L. In dry rolling woods. Winnfield, Winn Parish; Natchitoches, Natchitoches Parish; Shreveport, Caddo Parish. Flowers May 2. Fruit August.

Viburnum scabellum (Torr. & Gr.) Chapm. In damp woods over the whole State. April 15.

Viburnum nudum L. In swampy woods over the whole State. Flowers April 15. In east Louisiana for several years it has flowered also in October.

Viburnum nudum var. *angustifolium* Torr. & Gr. In east Louisiana. St. Tammany and Washington Parishes.

Symphoricarpos orbiculatus Moench. Collected in 1840 by Dr. Josiah Hale, near Alexandria, Rapides Parish.

Lonicera Caprifolium L. Escaped from cultivation and naturalized.

Lonicera japonica Thumb. Escaped from cultivation and naturalized.

Lonicera sempervirens Ait. Borders of woods and along streams over the whole State. Flowers April 6.

COMPOSITAE.

Iva fruticosa L. In swamps near the coast and salt marshes. Very abundant. Flowers April 15.

Baccharis halimifolia L. In marshes both salt and fresh and in cultivated ground as a weed. Flowers September.

Baccharis angustifolia Michx. Salt marshes. Bayou Barataria, Jefferson and Plaquemine Parishes. Flowers October 15.

OMITTED FROM TREE LIST.

Quercus virginiana L. Widely distributed over the State both in sandy and alluvial soil. Most abundant near the coast.

Quercus virginiana var. *eximia* Sarg. A shrub or small tree very common in pine barrens, St. Tammany and Tangipahoa Parishes.

Crataegus araioclada Sarg. Upland woods, Natchitoches, Natchitoches Parish.

Crataegus blanda Sarg. Near Minden, Webster Parish (B. F. Bush, No. 633).

× *Gleditsia texana* Sarg. Waste ground near the Red River, Shreveport. Caddo Parish.

Zanthoxylum clava-Herculis L. Small tree in sandy soil or on river banks. Marchouse, St. Landry Parish and West Feliciana Parish.

NOTES ON NORTH AMERICAN TREES, X¹

C. S. SARGENT

NEW SPECIES AND VARIETIES OF CRATAEGUS

Crataegus swanensis (§ *Crus-galli*), n. sp.

Leaves oblong-obovate, acute and short-pointed at apex, gradually narrowed and cuneate at the acute base and finely serrate above the middle with acute straight or slightly incurved teeth; fully grown when the flowers open and then glabrous above and slightly villose below along the midrib and primary veins, and at maturity thin, dull yellow-green on the upper surface, slightly paler on the lower surface, 3-5 cm. long and 2-2.5 cm. wide, with a slender midrib glabrous or slightly pubescent below and thin conspicuous veins impressed on the upper side of the leaf; petioles slender, slightly wing-margined at apex, densely villose early in the season, becoming pubescent, 5-10 mm. in length; leaves on vigorous shoots broad-obovoid to oval, often slightly lobed, more coarsely serrate, 5-6 cm. long and 3.5-4 cm. wide. Flowers opening early in June, 1.2-1.5 cm. in diameter, on long slender villose pedicels, in many-flowered globose villose corymbs; calyx-tube narrow-obconic, thickly covered with matted pale hairs, the lobes separated by wide sinuses, gradually narrowed from the base, slender, long-acuminate, laciniately glandular-serrate below the middle, slightly villose on the outer surface, densely covered with pale hairs on the inner surface; stamens 15; anthers yellow; styles 2 or 3. Fruit ripening the middle of October, on stout villose pedicels in pendent clusters, ellipsoidal or subglobose, scarlet, 1 cm. long and 8-9 mm. in diameter, the calyx little enlarged with a wide deep cavity pointed in the bottom and with spreading and reflexed persistent lobes; flesh thin, dry and mealy; nutlets 2 or 3, rounded at the ends, rounded or occasionally grooved on the back, 6-8 mm. long and 5-6 mm. wide, the narrow brown hypostyle extending to the middle.

A tree raised at the Arnold Arboretum from seeds (Seed List No. 2265) collected in 1906 by *B. F. Bush* at Swan, Christian County, Missouri, with stout branchlets densely villose early in their first season, becoming

¹ Forpart ix see p. 1

dark chestnut brown, lustrous and marked by pale lenticels in the autumn and dull gray-brown the following year, and armed with many stout straight or slightly curved chestnut brown spines 2-6 cm. in length.

There is unfortunately no specimen in the Arboretum herbarium from the tree from which this plant in the Arboretum was raised, and there are no notes concerning it. I venture, nevertheless, to describe it as a new species as it distinctly differs from the six species of this group previously described with pubescent corymbs and yellow anthers to which it is most closely related. Of these the four Louisiana species have thick coriaceous or subcoriaceous oblong-obovate leaves rounded or very rarely acute at apex. From *C. Mohrii* Beadle from western Georgia, central Alabama and eastern Mississippi, with obovate to rhombic usually acute leaves it differs in its larger flowers and fruit, in its densely villose corymbs and young branches, and in its more pubescent leaves. From *C. insignis* Sargent from the neighborhood of Kahokia and East St. Louis, Illinois, it differs in the shape of its less coarsely serrate leaves, smaller flowers in much more villose corymbs and smaller fruit.

Crataegus ohioensis (§ *Crus-galli*) n. sp.

Leaves oblong-obovate, acute and short-pointed or acuminate at apex, gradually narrowed and cuneate at base, finely and often doubly serrate usually only above the middle with straight teeth; more than half grown when the flowers open, and then glaucous below and glabrous, and at maturity thin, dark yellow-green, lustrous above, 5-8 cm. long, 1.8-4 cm. wide, with a thin midrib and slender prominent primary veins; petioles stout, grooved on the upper side, wing-margined nearly to the base, 6-10 mm. in length; leaves on vigorous shoots oblong-obovate to elliptic, rounded or acute at apex, coarsely serrate. Flowers opening from the 20th to the end of May, 1.3-1.5 cm. in diameter, on slender pedicels, in wide many-flowered slightly villose corymbs, their bracts and bractlets slender, elongated, glandular; calyx-tube narrow-obconic, glabrous, the lobes slender, acuminate, entire, glandular-villose near the apex, glabrous; stamens 20, anthers pale pink; styles 2-5. Fruit ripening at the end of September or early in October, ellipsoidal to obovoid, reddish green, dotted, 1-1.5 cm. long, 7-8 mm. in diameter, and crowned with the enlarged erect persistent calyx-lobes, the cavity deep and narrow; flesh hard and dry; nutlets 2-5, rounded at the ends, prominently ridged on the back, 5-7 mm. long, 4-5 mm. wide, the narrow dark hypostyle extending to just below the middle.

A tree sometimes 10 m. high, with a stout trunk often divided into several stems, a broad round-topped head of spreading light green branches and slender glabrous branchlets gray-green when they first appear, becoming reddish brown in their second year and armed with occasional slender nearly straight chestnut-brown lustrous spines 3-4 cm. in length, persistent and compound on old branches and trunks.

OHIO. Franklin County, roadsides near Columbus, *R. E. Horsey* and *J. H. Schaffner*, No. 2330 May 18, 1914; *E. R. Horsey*, No. 130, September 22, 1914; *E. R. Horsey*, No. 233 (type) May 14, 1915.

This tree differs from the described species of the *Crus-galli* Group with 20 stamens and rose colored or pink anthers in its narrow acute thin leaves, slightly villose corymbs and in the erect calyx lobes of the fruit.

***Crataegus Warneri* (§ *Crus-galli*), n. sp.**

Leaves ovate to oval or obovate, rounded or acute and short-pointed at apex, gradually or abruptly narrowed and cuneate at base, and coarsely serrate above the middle with straight gland-tipped teeth, nearly fully grown when the flowers open and then covered above with short white hairs and villose below along the midrib and primary veins, and at maturity thin, dark green and glabrous or occasionally still villose on the midrib above, pale and still villose below along the slender midrib and primary veins, 3.5–5 cm. long and 2.5–3.5 cm. wide; petioles stout, wing-margined to the base, densely villose at maturity, 5–7 mm. in length; leaves on vigorous shoots broad-ovate to semiorbicular, short-pointed at the rounded or acute apex, rounded and gradually narrowed below into a broad wing extending nearly to the base of the short petiole, more coarsely serrate, subcoriaceous, roughened above, 4.5–6 cm. long and broad, with a stout midrib and primary veins villose below. Flowers opening from the 10th to the middle of April, 1–1.2 cm. in diameter, on stout densely villose pedicels in compact many-flowered villose corymbs; calyx-tube narrow-obconic, thickly covered with matted pale hairs, the lobes narrowed from a broad base, slender, acuminate, glandular-serrate, slightly villose on the outer surface, puberulous on the inner surface; stamens 10; anthers red-purple; styles 2, rarely 3. Fruit ripening late in September, on slightly villose pedicels, ellipsoidal to subglobose, orange-red, 6–9 mm. long, the calyx little enlarged with a short tube and a wide shallow cavity flat in the bottom and with spreading often deciduous lobes; nutlets 2 or 3, rounded at the ends, ridged on the back with a broad deeply grooved ridge, 4 mm. long and 3.5–4 mm. wide, the narrow hypostyle extending to the middle.

A tree 7–8 m. high, with a slender stem covered with dark bark scaly near the base, erect branches forming a narrow head, and slender branchlets red-brown and covered with pale hairs when they first appear and dull gray and glabrous in their second year, and armed with occasional stout or slender chestnut-brown spines 3–4 cm. long; or a shrub 3 or 4 m. tall.

TEXAS. Walker County, Huntsville, *E. J. Palmer*, No. 12037, May 24, 1917, April 18, 1918; *R. S. Warner*, April 12, 1918. Cherokee County, Larissa, *E. J. Palmer*, No. 13346, April 16, 1918, No. 14446, September 18, 1918. Anderson County, Palestine, *E. J. Palmer*, No. 13360 (type), No. 14445, September 17, 1918.

Extremely rare in the three stations where it has been found, this Thorn is arborescent only at Palestine where it grows in woods. In Walker

and Cherokee Counties where it grows on dry banks it is a shrub, with several stems not more than 3 m. high.

Until the stones of the fruit are examined this species might pass for one of the *Macracanthae* Group, although the entire absence of lobes from the leaves and the rather compact corymbs are unusual in plants of that Group. Although it is an extreme form it is now referred with some doubt to the *Crus-galli* Group. The species of that Group which it most resembles is *C. sublobulata* Sargent from San Augustine, Texas, which differs in its slightly lobed glabrous thicker leaves, its broader glabrous corymbs, and in its 20 stamens with pink anthers.

***Crataegus poliophylla* (§ *Virides*), n. sp.**

Leaves oblong-obovate to elliptic, acute or acuminate at apex, gradually narrowed and cuneate at base, finely doubly serrate above the middle with straight teeth and usually irregularly divided toward the apex into short acute lobes; thickly covered when they unfold with white hairs longer and more abundant on the lower than on the upper surface, nearly glabrous above when the flowers open and more or less pubescent below, and at maturity subcoriaceous, glabrous, yellow-green and lustrous on the upper surface, pale on the lower surface, 3-4 cm. long and 2.5-3 cm. wide, with a prominent midrib and slender veins deeply impressed above; on leading shoots up to 6 cm. long and 4.5 cm. wide; petioles slender, deeply grooved, narrowly wing-margined toward the apex, densely villose-pubescent early in the season, becoming glabrous, 1.5-2 cm. in length. Flowers opening late in March or early in April, 1.5 cm. in diameter, in wide lax 7-15-flowered densely villose corymbs; calyx-tube broad-obconic, villose like the slender pedicels, the lobes short, gradually narrowed from the base, glandular-serrate or nearly entire, glabrous on the outer surface, slightly villose on the inner surface; stamens 20; anthers yellow; styles 4 or 5. Fruit ripening late in September, in pendent clusters, globose to short-oblong or ovoid, orange-red, 6 or 7 mm. in diameter, the calyx prominent, with a short tube, reflexed lobes and a wide shallow cavity broad in bottom; nutlets 4 or 5, rounded at apex, gradually narrowed at base, slightly grooved on the back, 3-4 mm. long, 2.5-3 mm. wide, the narrow hypostyle extending to the middle.

A tree occasionally 4 or 5 m. high, with a trunk 8-10 cm. in diameter, covered with dark rough bark, smooth ashy gray branches and slender branchlets thickly covered early in the season with long matted white hairs, becoming glabrous and ashy gray, and armed with slender straight spines 1.5-2.5 cm. in length.

TEXAS. Brazoria County, *B. F. Bush*, No. 11 (5D), March 27, 1901, No. 870 (59), September 21, 1901, No. 970 (5b), October 2, 1901, No. 1212 (type), March 26, 1902. Fort Bend County, thickets in drained soil, Duke, *E. J. Palmer*, No. 5083 (3a), April 2, 1914, No. 6695 (3a), October 1, 1914.

Distinct in the shape of the coriaceous leaves and in their villose covering while young, and in the villose corymbs. Two specimens collected at

Columbia by *B. F. Bush* (No. 971), October 3, 1901, with thicker and more lustrous broad-ovate leaves up to 8 cm. long and 7 cm. wide, rather larger fruit and more zigzag branchlets probably represent an extreme form of this species. Much land has been cleared in the neighborhood of Columbia in recent years and this tree has probably disappeared as various attempts to rediscover it have failed.

Crataegus stenosepala (§ *Virides*), n. sp.

Leaves elliptic to oblong-elliptic or obovate, acute or acuminate at apex, gradually narrowed and cuneate at base, sharply and coarsely serrate above the middle with straight teeth, and often divided toward the apex into short lobes; when they unfold deeply tinged with red and slightly pubescent, nearly fully grown when the flowers open and then roughened above by short white hairs and conspicuous below by the thick snow-white pubescence along the midrib and on the petioles, the villose primary veins and by the axillary clusters of white hairs, and at maturity glabrous, yellow-green and lustrous on the upper surface, paler on the lower surface, 3.5–5.5 cm. long and 1.5–3 cm. wide, with a thin midrib and slender primary veins impressed above; petioles 6–7 mm. in length; leaves on vigorous shoots oblong-obovate, thicker, acuminate, cuneate at base, more coarsely serrate and more deeply lobed and up to 7 cm. in length and 4 cm. in width. Flowers opening toward the end of March, 2 cm. in diameter, in wide loose 10–20-flowered slightly villose corymbs; calyx-tube broad-obconic, sparingly covered with long white ridged hairs, the lobes gradually narrowed from the base, slender, long-acuminate, minutely and irregularly serrate, glandular-ciliate, glabrous on the outer surface, obscurely ciliate on the inner surface, 7–8 mm. long; stamens 20; anthers pale yellow; styles 5. Fruit ripening early in October, ellipsoidal to slightly obovoid, on slender glabrous pedicels in drooping clusters, orange-red, 7 or 8 mm. long, 5–6 mm. thick, with thin dry flesh, the calyx with a distinct tube, spreading lobes and a deep narrow cavity pointed in the bottom; nutlets 4 or 5, rounded at base, acute at apex, only slightly grooved on the back, 7–8 mm. long and 3–4 mm. wide, the pale broad hypostyle extending to the middle.

A shrub or small tree 4–5 m. high, with stems forming large thickets, and covered with dark slightly scaly bark and slender slightly zigzag branchlets covered when they first appear with long matted white hairs, becoming glabrous and light red-brown during their first season and ashy gray in their second year, and armed with numerous nearly straight slender spines 2–4 cm. in length.

TEXAS. Fort Bend County, low well drained soil near Duke, *E. J. Palmer*, Nos. 5093 (10a) and 6701 (10a, type) April 2 and October 1, 1914.

Distinct from the species of this Group in the remarkably long slender calyx-lobes and conspicuous when in flower from the broad band of snow white tomentum covering the under side of the lower half of the midrib of the leaves.

***Crataegus abbreviata* (§ *Virides*), n. sp.**

Leaves ovate to obovate, elliptic or suborbicular, acute or rounded and abruptly short-pointed at apex, narrowed and cuneate or rounded at base, sharply often doubly glandular-serrate usually only above the middle, and often slightly divided usually toward the apex into short acute lobes; covered above when they unfold with short white hairs and densely tomentose below, fully grown when the flowers open and then glabrous with the exception of a few hairs along the upper side of the midrib, and of small axillary tufts below, and at maturity thin, yellow-green, glabrous, and 2.5–3 cm. long and 2–2.5 cm. wide, often appearing 3-nerved by the greater prominence of the lowest pair of primary veins; petioles slender, slightly villose-pubescent early in the season, soon becoming glabrous; leaves on vigorous shoots broad-ovate to semiorbicular or elliptic, rounded or acuminate at apex, rounded or cuneate at base, often laterally lobed, 4–5 cm. long and broad. Flowers opening early in April, 1.8–2 cm. in diameter, in slightly villose compact usually 10–15-flowered corymbs crowded on the branches; calyx-tube broad-obconic, slightly villose, the lobes short, entire, often slightly villose or glabrous on the outer surface, villose on the inner surface, mostly deciduous from the ripe fruit; stamens 20; anthers yellow; styles 4 or 5. Fruit ripening early in October, on slightly villose pedicels, in lax drooping clusters, subglobose, dark red, 6–8 mm. in diameter, with thin succulent flesh, the calyx little enlarged, with a deep cavity broad in the bottom; nutlets 4 or 5, rounded at the ends, broader at the apex than at the base, slightly grooved on the back, 3–4 mm. long, the narrow hypostyle extending to the middle.

A tree 5–5.5 m. high, with a small stem and slender nearly straight branchlets slightly villose when they first appear, dark orange-brown and glabrous or nearly glabrous when the flowers open, and gray-brown in their second year, and unarmed or furnished with occasional slender straight spines 3–4 cm. in length.

TEXAS. BRAZOS COUNTY, low woods on the Brazos River, near Brazoria, E. J. Palmer, Nos. 5131 (4) and 6734 (4, type), April 7, and October 5, 1914.

Although there is little in the flowers and fruit or in the habit of this plant to distinguish it from some of the other *Virides* species which grow in the valley of the lower Brazos River, where this Group is represented perhaps by its greatest diversity of forms, the short small leaves are so distinct in shape that until the Texas species are better known it appears necessary to treat it as a species.

***Crataegus desertorum* (§ *Virides*), n. sp.**

Leaves ovate to slightly obovate or suborbicular, acute, acuminate or rounded at apex, gradually or abruptly narrowed and cuneate at base, finely doubly serrate usually only above the middle with blunt glandular teeth, and often slightly divided into short acute lobes; covered when they unfold with short lustrous white hairs, and villose below along the midrib

and primary veins, and at maturity thin, yellow-green and slightly roughened above by short white hairs, pale and glabrous or occasionally slightly villose toward the base of the prominent midrib below, 1.5–2 cm. long and 1–1.5 cm. wide, with three or four pairs of primary veins extending to the points of the lobes, or 3-nerved from the base; petioles slender, wing-margined to the middle, densely villose early in the season, becoming nearly glabrous in the autumn, 5–6 mm. in length; leaves on vigorous shoots ovate, broad and rounded at base, acute at apex, often deeply lobed, 2–2.5 cm. long and wide. Flowers appearing after the middle of April, small, in 4- or 5-flowered lax glabrous corymbs; calyx broad-obconic, slightly villose, the lobes slender, acuminate, obscurely serrate, glabrous on the outer surface, villose on the inner surface; stamens 20; anthers pale yellow; styles 4 or 5. Fruit ripening the middle of October, subglobose, orange-red, 4–5 mm. in diameter, with thin dry flesh; the calyx enlarged and prominent, with erect or spreading glabrous lobes and a wide shallow cavity broad in the bottom; nutlets 4 or 5, rounded and rather broader at apex than at base, only slightly grooved on the back, 4 mm. long and 2.5–3 mm. wide, the broad pale hypostyle extending to below the middle.

A shrub 3 m. high, with stems covered with thin pale bark flaky near their base, and slender unusually zigzag branchlets red-brown and slightly villose when they first appear, soon glabrous, ashy gray at the end of their first season and horribly armed with many slender straight or slightly curved chestnut-brown ultimately gray spines 2.5–5 cm. in length.

TEXAS. Uvalde County, in the rocky bed of a creek usually dry, but flooded during a few hours two or three times during the year, near Uvalde, *E. J. Palmer*, Nos. 11348, 12379 (type), 12973, March 22, June 17, October 12, 1917; Nos. 13322, 13498, 13699, 14496, April 6, May 5, May 26, September 24, 1918.

In its unusually zigzag branches, numerous long slender spines and minute fruit this is perhaps the most distinct species of the Virides Group. The fact that it inhabits a region of rare rainfall where the soil in which it grows is only thoroughly wet two or three times in the year would be remarkable for any species of *Crataegus*; it is the more remarkable for a species of this Group, for the Virides, growing usually in low ground, are moisture loving plants. It is unfortunate that Mr. Palmer has been able to find only a single plant.

Crataegus tripartita (§ Virides), n. sp.

Leaves usually elliptic, acute or acuminate at apex and gradually narrowed to the cuneate base, or rarely ovate or obovate and broad-cuneate or rounded at base, finely serrate above the middle with straight or slightly incurved teeth, rarely slightly lobed, often furnished below early in the season with axillary tufts of snow-white pubescence, otherwise glabrous, subcoriaceous, yellow-green, lustrous above, 3–4 cm. long, 1.5–2.5 cm. wide, with a thin midrib and slender prominent veins deeply impressed on the upper surface; petioles slender, narrowly wing-margined

often to below the middle, 1-2 cm. in length; leaves on vigorous shoots broad-ovate, rounded, truncate, or abruptly cuneate at the wide base, often 3-lobed by narrow sinuses extending nearly to the midrib, the terminal lobe often lobulate, coarsely glandular-serrate, conspicuously reticulate-venulose with a vein often extending to the bottom of a sinus, 3-4 cm. long and 2-3 cm. wide, their petioles stout, wing-margined, glandular, 1-1.5 cm. in length. Flowers opening late in March, 1.5-2 cm. in diameter, on slender glabrous pedicels, in small 7-10-flowered corymbs closely set on the branches; calyx-tube abruptly enlarged upward, glabrous, the lobes gradually narrowed from a broad base, acuminate, entire, glabrous, usually deciduous from the fruit; stamens 20; anthers pale yellow; styles 5. Fruit ripening after the middle of September, short-oblong, yellow-green, 7-10 mm. long and 5-8 mm. wide, with soft succulent flesh, the calyx little enlarged, with a deep narrow cavity; nutlets 5, acute at ends, only slightly grooved on the back, 3-4 mm. long, the narrow hypostyle extending to the middle.

A shrub with several stems, 3-3.5 m. tall, or a round-topped tree 6 or 7 m. high, with dark gray scaly bark, and slender straight or slightly zigzag glabrous branchlets dark reddish brown when they first appear, becoming lighter-colored at the end of their first season, and ashy gray the following year, and armed with occasional slender nearly straight chestnut brown spines 2-3 cm. in length.

TEXAS. Brazoria County, low woods along the Brazos River, near Columbia, *B. F. Bush*, No. 948, September 30, 1901, No. 2, March 24, 1909 *E. J. Palmer*, No. 5040 (5), March 27, 1914, September 28, 1914 (type), No. 5102 (8), April 4, 1914, No. 6688 (8), September 30, 1914.

Distinct in the subcoriaceous leaves, those on vigorous branchlets often deeply 3-lobed with lobes coarsely glandular serrate to the base, and in its yellow-green fruit.

Crataegus anamesa (§ *Virides*), n. sp.

Leaves elliptic to broad-ovate or slightly obovate, acute at apex, gradually or abruptly narrowed and cuneate at base, finely serrate with short broad teeth, and often slightly divided above the middle into broad rounded lobes; when they unfold tinged with red, and villose above and thickly covered below with matted white hairs, not more than half grown when the flowers open and then glabrous or nearly glabrous above, sparingly villose and conspicuous below by the broad band of snow-white hairs along the lower part of the midrib, and at maturity subcoriaceous, nearly glabrous, dark green and lustrous on the upper surface, pale on the lower surface, 3-5 cm. long and 3-5 cm. wide; petioles slender, densely villose early in the season, becoming glabrous, 1.5-2 cm. in length; leaves on vigorous shoots broad-ovate, rounded or acute at apex, rounded or broad-cuneate at base, finely serrate, slightly lobed with short broad lobes, up to 6 or 7 cm. long and wide, their petioles stout, slightly wing-margined at apex, often furnished with occasional glands, 2.5-3 cm. in

length. Flowers appearing at the end of March or early in April, 2–2.5 cm. in diameter, in compact mostly 10–15-flowered densely villose corymbs crowded on the branches; calyx-tube narrow-obconic, glabrous except for occasional short white hairs, the lobes gradually narrowed from the base, entire or rarely minutely dentate, glabrous on the outer surface, villose on the inner surface, mostly deciduous from the ripe fruit; stamens 20; anthers pale yellow; styles 4 or 5. Fruit ripening early in October, on nearly glabrous pedicels, in few-fruited drooping clusters, subglobose to short-oblong or slightly obovoid, dark red, 9–10 mm. in diameter, the calyx little enlarged, with a narrow deep cavity pointed in the bottom; nutlets 4 or 5, narrowed and rounded at the ends, only slightly grooved on the back, about 5 mm. long, the dark narrow hypostyle extending to below the middle.

A shrub 4–5 m. high, with stems covered with gray slightly scaly bark, small erect smooth dark gray branches and slender slightly zigzag branchlets densely covered with white hairs early in the season, becoming glabrous and dull reddish brown by autumn, and dark gray the following year and apparently without spines.

TEXAS. Fort Bend County, Duke, *E. J. Palmer*, Nos. 5090 (8) and 6698 (8), April 2 and October 1914 (type).

The size of the fruit of this species is intermediate between that of typical *C. viridis* Linnaeus and that of a small group of species with fruit from 1.5–2 cm. in diameter of which *C. nitida* Sargent is the best known. Although much more pubescent, this Texas shrub resembles in the shape of its leaves another of the large-fruited Virides species, *C. atrorubens* Ashe of East St. Louis, Illinois.

Crataegus antiplasta (§ Virides), n. sp.

Leaves ovate to elliptic or semiorbicular, acute or rounded at apex, cuneate at base, finely doubly serrate above the middle with straight teeth, dark red and covered with short white hairs when they unfold, almost fully grown when the flowers open and then nearly glabrous above and slightly villose along the midrib and primary veins below, and at maturity thin, dark green and glabrous on the upper surface, paler and glabrous or still villose on the midrib and veins below, 3–4 cm. long and 2–3 cm. wide, with veins slightly impressed above; petioles slender, slightly wing-margined at apex, villose early in the season, becoming glabrous, 1–1.5 cm. in length; leaves on vigorous shoots ovate to suborbicular, acute at apex, rounded or cuneate at base, more coarsely serrate, sometimes slightly 3-lobed by narrow sinuses, up to 5 or 6 cm. long and 3–4 cm. wide, their petioles stout, broadly wing-margined nearly to the middle, occasionally glandular, often sparingly villose through the season, 8–10 mm. in length. Flowers opening late in March or early in April, 2.5 cm. in diameter, in compact glabrous mostly 5–10-flowered corymbs; calyx-tube narrow-obconic, glabrous, the lobes gradually narrowed from a broad

base, slightly dentate, glabrous on the outer surface, villose on the inner surface, usually deciduous from the ripe fruit; stamens 20; anthers pale yellow; styles 4 or 5. Fruit ripening early in October, subglobose, scarlet, 7-8 mm. in diameter, with thin dry flesh, the calyx little enlarged, with a wide deep cavity broad in the bottom; nutlets 4 or 5, rounded at the ends, rather broader at apex than at base, only slightly grooved on the back, the wide hypostyle extending to the middle.

A tree 4-5 m. high, with a slender stem covered with close gray bark, separating into small scales, erect dark gray branches and slender straight or slightly zigzag branchlets thickly covered when they first appear with matted white hairs, becoming glabrous and reddish brown in their first season and ashy gray the following year, and armed with numerous nearly straight or slightly curved ashy gray spines. 2-3.5 cm. in length.

TEXAS. Fort Bend County, rich prairies near Duke, *E. J. Palmer*, Nos. 5082 (3) (type). and 6894 (3).

From related species this little tree can be distinguished by the often nearly orbicular or occasionally slightly 3-lobed leaves on vigorous branchlets and by the small loosely attached scales of the bark of the trunk.

Crataegus antimima (§ *Virides*), n. sp.

Leaves ovate, elliptic or rarely obovate, acute or acuminate at apex, abruptly or acutely cuneate at base, finely doubly serrate above the middle with straight teeth and slightly lobed with acute lateral lobes; covered above when they unfold with short caducous white hairs and usually furnished below with axillary tufts of white pubescence, and at maturity thin, yellow-green and lustrous on the upper surface, dull and paler on lower surface, 3-4 cm. long and 2.5-3 cm. wide, with a thin midrib and primary veins impressed above; petioles slender, slightly wing-margined at apex, thickly coated until after the flowers open with matted white hairs, becoming glabrous, 5-12 mm. in length; leaves on vigorous shoots oblong to ovate or obovate, more coarsely serrate and usually more deeply lobed, up to 6-7 cm. long and 4-4.5 cm. wide. Flowers opening late in March or early in April, 2 cm. in diameter, in small compact usually 7-12-flowered glabrous corymbs; calyx-tube broad-obconic, glabrous, the lobes abruptly narrowed from a broad base, slender, acuminate, entire, glabrous, often deciduous from the ripe fruit; stamens 20; anthers pink, styles 5, surrounded at base by a conspicuous ring of white tomentum. Fruit ripening early in October, on slender pedicels in drooping clusters, subglobose to slightly obovoid, dark orange-red, 7-8 mm. in diameter; with thin soft flesh, the calyx little enlarged, with a narrow cavity not contracted in the bottom; nutlets 5, rounded at the ends, broader at apex than at base, only slightly grooved on the back, 4-5 mm. long, 2.5-3 mm. wide, the narrow hypostyle extending to the middle.

A shrub 4-5 m. high, with stems covered with dark slightly scaly bark, small erect dark gray branches, and slender nearly straight branchlets

thinly covered when they first appear with matted pale hairs, soon glabrous, reddish brown during their first season, becoming ashy gray and unarmed or occasionally furnished with short slender straight spines sometimes becoming compound on main stems.

TEXAS. Fort Bend County, near Duke, *E. J. Palmer* Nos. 5092 (10) and 6700 (10), April 2 and October 1, 1914 (type).

This species, which resembles *C. poliophylla* Sargent of the same general region in the shape of the leaves and in the size of the flowers, differs from it in the nearly entire absence of pubescence which is so conspicuous on *C. poliophylla*, and in the pink not yellow anthers

***Crataegus sutherlandensis* (§ *Virides*), n. sp.**

Leaves ovate, acute at apex, gradually or abruptly narrowed and concave-cuneate at base, coarsely doubly serrate with straight or incurved acuminate teeth; coated with pale pubescence when they unfold, soon glabrous, fully grown when the flowers open, and at maturity thin, dull yellow-green, slightly scabrate on the upper surface, 3-4 cm. long and 2-2.5 cm. wide, with a thin midrib and slender primary veins slightly raised on the upper surface; petioles slender, slightly wing-margined, sparingly villose early in the season, soon glabrous, 8-15 mm. in length; leaves on vigorous shoots rounded at base, often irregularly divided into short wide lateral lobes, 4-5 cm. long and broad. Flowers opening late in March, 2 cm. in diameter, on long slender glabrous pedicels, in lax usually 7-10-flowered corymbs; calyx-tube narrow-obconic, glabrous, the lobes slender, acuminate, often laciniately divided near the base into glandular teeth, glabrous on the outer surface, villose-pubescent on the inner surface; stamens 20; anthers faintly tinged with pink; styles 5. Fruit ripening the end of September, subglobose, often truncate at base, orange-red, 7-8 mm. in diameter, the calyx prominent, with erect and spreading lobes and a narrow deep cavity; nutlets 5, rounded at apex, acute at base, obscurely grooved on the back, 5-6 mm. long, 3-4 mm. wide, the broad conspicuous hypostyle extending nearly to the base.

A slender tree 4 or 5 m. high, with a trunk covered with dark gray bark separating freely into long thin oblong flakes disclosing the red inner bark, erect and spreading branches, their bark smooth and gray, and slender slightly zigzag branchlets orange-green and sparingly pilose above when they first appear, soon red-brown and glabrous, and ashy gray in their second season, often unarmed or furnished with occasional straight slender spines up to 5 cm. in length.

TEXAS. Wilson County, rich upland woods on the Cibalo River, near Sutherland Springs, *B. Mackensen*, No. 3, March 27, 1910, No. 257, September 28, 1913; *C. S. Sargent*, Nos. 6 and 7, March 30, 1913; *E. J. Palmer*, No. 9206 (No. 3), March 17 and 30, 1916, No. 9300 (No. 3), March 30, 1916, No. 10805 (No. 3), September 23, 1916, No. 9291 (No. 3a), March 30, 1916, No. 9292 (4), March 30, 1916, No. 10799 (4), September 25, 1916 (type), No. 9293 (4a), March 30, 1916, No. 10800 (4a), September 25, 1916, No. 9295 (4b), March 30, 1916

No. 10802 (4b), September 25, 1916, No. 10798 (3a), September 25, 1911, No. 9307 (6), March 30, 1916, No. 10812 September, 25, 1916.

Crataegus sutherlandensis var. *spinescens* Sarg., n. var.

Differing from the type in its rather smaller leaves more pubescent early in the season and often furnished below with conspicuous tufts of white axillary hairs, and in its larger and more numerous spines.

A shrub or small tree 4-5 m. high, forming thickets of slender stems covered with dark scaly bark separating in small narrow scales, slender zigzag branchlets armed with many slender straight spines from 3-6 cm. in length.

TEXAS. Wilson County, low woods near Sutherland Springs, *C. S. Sargent* April 8, 1915; *E. J. Palmer*, Nos. 9294 and 10801 (5), March 30 and September 25, 1916 (type), No. 9308 and 10816 (5a) March 30 and September 25, 1916.

Crataegus caerulescens (§ *Pruinosae*), n. sp.

Leaves glabrous, acuminate at apex, broad-cuneate to rounded at base, deeply laterally lobed with acuminate lobes, and finely doubly serrate with straight or slightly incurved gland-tipped teeth; thin and fully grown the end of May, and at maturity thick, dark blue-green and dull on the upper surface, pale blue-green on the lower surface, 4-4.5 cm. long and 3-3.5 cm. wide, with a thin prominent midrib and slender primary veins extending to the points of the lobes; petioles slender, furnished with occasional glands, 1-1.5 cm. in length; leaves on vigorous shoots often truncate at base and 4 cm. long and broad. Flowers opening the end of May, 1.8-2 cm. in diameter, on long slender pedicels in small compact corymbs with narrow glandular-serrate bracts and bractlets; calyx-tube broad-obconic, the lobes short, narrowed from a wide base, acuminate, glabrous; stamens 18-20; anthers white; styles 4 or 5. Fruit erect on slender pedicels, ripening in October, obovoid, gradually narrowed from near the top to the acute base, dull red covered with a glaucous bloom, 1 cm. long and 7-8 mm. in diameter, the calyx little enlarged with a short tube, a wide shallow cavity broad in the bottom, and spreading and reflexed persistent lobes; nutlets 4 or 5, rounded at apex, gradually narrowed and acute at base, 8-9 mm. long and 3 mm. wide.

A plant with a single stem, now almost 3 m. high with slender nearly straight glabrous branchlets yellow-green when they first appear, becoming light red-brown at the end of their first season and dull gray-brown the following year, and armed with numerous slender straight or slightly curved chestnut brown spines 3-4.5 cm. in length.

Arnold Arboretum No. 4572 (type), September 27, 1912, May 27, 1919. A plant brought to the Arboretum by *C. E. Faxon* from Orient Heights, Breeds Islands, Boston Harbor in the autumn of 1899.

This plant is peculiar in the blue color of the leaves. It is most closely related to *C. Porteri* Britton from Tannersville and Stroudsburg, Pennsylvania, a species also with blue leaves, 20 stamens and white anthers, but

the leaves of that species are all acutely cuneate at base, thicker and lustrous on the upper surface, the flowers are larger in usually fewer-flowered corymbs, and the fruit is less gradually narrowed to the base with a narrow cavity pointed in the bottom, and droops on more slender pedicels. *C. Porteri* as it grew in 1908 in the woods in low undrained soil in the neighborhood of Tannerville was a slender shrub about 5 m. high.

***Crataegus ellipticifolia* (§ Pruinosaes), n. sp.**

Leaves elliptic, acute at the ends, divided above the middle into short acute lobes, and finely often deeply serrate often to below the middle with acute glandular teeth; covered above when they unfold with short white hairs, becoming glabrous, and at maturity thin, smooth and yellow-green on the upper surface, paler below, 4–5 cm. long and 2.5–3.5 cm. wide, with a slender midrib and primary veins; petioles slender, glabrous, 2–3 cm. in length; leaves on vigorous shoots often broad-ovate, rounded or truncate at base, occasionally deeply lobed, more coarsely serrate, 4–6 cm. long and 4–5 cm. wide. Flowers opening late in May, 1–1.2 cm. in diameter, on long slender pedicels, in mostly 7–9-flowered slightly villose corymbs with long slender conspicuous bracts and bractlets; calyx-tube narrow-obconic, glabrous, the lobes gradually narrowed from a broad base, slender, acuminate, entire or rarely furnished with an occasional tooth, glabrous; stamens 20; anthers small, creamy white; styles 5. Fruit ripening early in October, short-oblong to subglobose, only slightly angled, hard, turning dull red at maturity, about 1 cm. in diameter, the calyx only slightly enlarged with a short tube, spreading closely appressed lobes, and a deep narrow cavity rounded in the bottom; nutlets broad and rounded at base, narrower and often acute at apex, prominently ridged on the back with a deeply grooved ridge, 5–6 mm. long and 3.5–4.5 mm. wide, the narrow-pale hypostyle extending to below the middle.

A shrub forming thickets with slender slightly zigzag glabrous branchlets, yellowish green early in their first season, becoming light red-brown, and armed with slender nearly straight chestnut-brown spines persistent and often compound on old stems.

OHIO. Delaware County, in pastures, near Delaware, *E. R. Horsey*, No. 123, September 25, 1913, No. 231 (type), May 27 and September 25, 1914.

From other *Pruinosae* with leaves covered above while young with short white hairs, flowers with 20 stamens and white or yellow anthers this species differs in its elliptic leaves.

***Crataegus mariettensis* (§ Pruinosaes), n. sp.**

Leaves oblong-ovate, acuminate, rounded or truncate at base, slightly divided into three or four pairs of short broad acute lobes, and coarsely doubly serrate with straight glandular teeth; tinged with red and covered above by white hairs when they unfold, nearly glabrous when the flowers open, and at maturity thin, yellow-green, smooth and glabrous above,

paler below, 6-7 cm. long and 4-5 cm. wide, with a slender midrib and primary veins; petioles slender, glabrous, occasionally glandular, 2.5-3 cm. in length; leaves on vigorous shoots, broad-ovate, rounded, truncate or cordate at base, more deeply lobed and more coarsely serrate, 5-6 cm. long and broad, with petioles only 1.5-2 cm. long. Flowers opening about May 20, 1.5-1.7 cm. in diameter, on slender pedicels, in small compact mostly 4-7-flowered glabrous corymbs with coarsely glandular-serrate bracts and bractlets; calyx-tube broad-obconic, glabrous, the lobes separated by wide sinuses, short, broad, acuminate, tipped with a dark gland, entire or obscurely glandular-serrate, glabrous; stamens 10; anthers pink, styles usually 5. Fruit ripening early in October, subglobose but broader than high, flattened at the ends, hard, green, 1-1.2 cm. in diameter, the calyx sessile with a shallow cavity 5 or 6 mm. in diameter, the lobes deciduous; flesh thin, hard and dry, nutlets 5, rounded at the ends, slightly grooved on the back, 4 or 5 mm. long and wide, the pale hypostyle nearly covering their inner faces.

A tree 6 or 7 m. high, with a single small trunk covered with dark gray bark, separating near the base in loose scales, ascending branches forming an open head, and stout slightly zigzag glabrous branchlets light yellow-green when they first appear, becoming dark chestnut-brown, marked by pale lenticels and armed with numerous stout nearly straight dark chestnut brown spines persistent and becoming compound on the trunk and large branches.

OHIO. Washington County, near Marietta, *R. E. Horsey*, No. 602 (type), May 20 and September 30, 1917.

From the other species of this group already described with depressed globose fruit and a red shallow fruit calyx, this new species differs in the shape of the leaves which are not cuneate at base as in those species, but broad and rounded or truncate.

***Crataegus uvaldensis* (§ Molles), n. sp.**

Leaves ovate, acute and short-pointed at apex, concave-cuneate at base, slightly or on leading shoots more deeply lobed usually only above the middle with short acuminate lobes, and deeply doubly serrate often nearly to the base with slender acuminate gland-tipped teeth, covered above when they unfold with short ridged pale hairs and pale and villose below especially along the midrib and primary veins, and at maturity thin, dark dull green and scabrate on the upper surface, pale and nearly glabrous on the lower surface, 4-5 cm. long and 3-3.5 cm. wide, with a slender slightly villose pale yellow midrib and primary veins; petioles slender, slightly wing-margined at the apex by the decurrent base of the blade, thickly covered early in the season with matted pale hairs, becoming pubescent, 6-15 mm. in length; leaves on vigorous shoots more deeply sometimes 3-lobed with large foliaceous coarsely and sharply serrate stipules. Flowers opening early in April, about 1 cm. in diameter, on

slender villose pedicels in small compact mostly 5-7-flowered corymbs, densely villose like the narrow obconic calyx-tube; calyx-lobes slender, acuminate, entire or minutely and irregularly glandular-serrate, pubescent on the outer surface, densely villose on the inner surface, deciduous from the ripe fruit; stamens 5-10; anthers yellow; styles 3-5. Fruit ripening early in October, on more or less densely villose erect pedicels in small clusters, globose, bright red, 1-1.4 cm. in diameter, slightly pubescent with a ring of white hairs surrounding the little enlarged calyx composed of a short tube and a deep narrow cavity pointed in the bottom, flesh thick and dry; nutlets 3-5, gradually narrowed and rounded at the ends, slightly ridged on the back, 4-5 mm. long and 3-4 mm. wide, the broad conspicuous hypostyle extending to below the middle.

A shrub 3-4 m. high, with a stem covered with thin scaly bark, and slender nearly straight branchlets thickly covered when they first appear with matted pale hairs, light orange-brown and slightly hairy at the end of their first season and ashy gray and glabrous the following year, and armed with numerous slender straight gray spines 3-5 cm. long.

TEXAS. Uvalde County, foot of the bluff of the Sabinal River, Utopia, *E. J. Palmer*, No. 11525, April 10, 1917, No. 12946 (type), October 7, 1917. Menard County, low woods on the San Saba River, Menard, *E. J. Palmer*, No. 11889 (sterile branches only), May 12, 1917.

Distinct from the northern species of the Mollis Group in its small leaves, flowers and fruit and shrubby habit, this Texas shrub changes earlier conceptions of this Group.

Another species of the Mollis Group from western Texas with generally smaller less sharply serrate more pubescent leaves, flowers with 5-10 stamens, and rose-purple or pink anthers, and smaller fruit covered early in the season with short pale hairs but without the ring of white hairs at the base of the calyx with a wide shallow cavity and persistent lobes, is until that species is better known referred to *C. Greggii* Eggleston from the neighborhood of Saltillo, Coahuila, Mexico. As this species grows in Texas it is a tree 12 feet high which has been found on the bluffs of the Guadalupe River below Kerrville, Kerr County, *B. Mackensen*, No. 7, May 1, 1910, No. 1, April 13 and September 21, 1913, No. 2, April 13, 1913, No. 253, September 21, 1913, No. 4, September 21, 1913, No. 20 (same tree as No. 4), April 21, 1914; *E. J. Palmer*, No. 9922 (1), May 29, 1916, No. 10882, October 2, 1916, No. 11497, April 8, 1917.

A specimen with immature fruit collected by *E. J. Palmer* (No. 10168) on the bank of the Frio River near Leaky, Real County, June 11, 1916, and a specimen collected by him (No. 10899) at Junction, Kemble County, October 6, 1916, are also doubtfully referred to *C. Greggii*.

Crataegus rotundifolia var. *aboriginum* (§ *Rotundifoliae*), n. var.—*Crataegus aboriginum* Sargent in *Rhodora*, v. 164 (1903).

Differing from *C. rotundifolia* Moench in its large obovate or ovate leaves acute or rounded at apex, up to 7-10 cm. long and 5-8 cm. wide,

in its flowers 2 cm. in diameter, in its slightly villose corymbs, and in its larger fruit up to 1.5 cm. in diameter, with a more prominent calyx with often erect lobes.

The description of *C. aboriginum* was based on a single individual found by Mr. J. G. Jack at Caughnawaga in the Province of Quebec in 1899 and 1890; it has since been collected at other stations, and a further acquaintance with this plant shows by intermediate forms that it cannot be distinguished specifically from *C. rotundifolia*. The larger leaves, flowers and fruit, and the slightly villose pedicels of the most of plants examined make it, however, desirable to distinguish it as a variety.

The original plant of *C. aboriginum* was a shrub with stems only 3 m. high; the plants of St. Annes de Bellevue are trees from 7-8 m. tall. The following additional specimens are referred to this variety.

CANADA. Province of Quebec, Caughnawaga, *J. G. Jack*, No. 97, September 24, 1900, St. Annes de Bellevue, near Macdonald College, *J. G. Jack*, Nos. 207 and 208, September 23, 1913, May 30, 1914; La Tortue, *Brother M. Victorin*, October 1920; Hill County, *J. Dunbar*, Nos. 172 and 187, September 18, 1915. Province of Ontario, Gananoque, *J. Dunbar*, No. 18, June 11 and September 27, 1907, No. 66, September 1911, Belleville, *J. Dunbar*, No. 62, June 3, 1908, and September 26, 1907, Kingston, *J. Dunbar*, No. 128, October 14, 1912, June 1, 1913.

Crataegus rotundifolia f. *rubescens*, n. forma.

Differing from the type only in the distinctly red color of the leaves in spring and summer.

CANADA. Province of Quebec, St. Anne, Montreal Island, *J. G. Jack*, No. 202 (type), May 29 and September 23, 1913, Baie d'Urfe Station, G. T. R. R., *J. G. Jack*, No. 206, September 23, 1913, No. 215, May 30 and September 25, 1914.

Plants raised at the Arboretum from the seed of No. 215 have retained the red color of their leaves.

Crataegus mercerensis (§ *Rotundifoliae*), n. sp.

Leaves obovate to rarely ovate or semiorbicular, acute and short-pointed at apex, concave-cuneate at the entire base, usually slightly divided above the middle into short acute lobes, finely often doubly serrate with straight gland-tipped teeth, thin, glabrous, smooth and dark yellow-green on the upper surface, pale on the lower surface, 4-6 cm. long and 3-4 cm. wide, with a thin midrib and slender veins running to the points of the lobes; petioles slender, narrowly wing-margined at apex, often furnished with occasional glands, sparingly villose on the upper side early in the season, soon glabrous, 1-2 cm. in length. Flowers appearing from the middle to the end of May, about 1 cm. in diameter, on slender glabrous pedicels in 5-12-flowered glabrous compact corymbs with lanceolate to linear glandular caducous bracts and bractlets; calyx-tube narrow-obconic, glabrous, the lobes abruptly narrowed from a wide base, short, serrate toward the acute or rarely 3-lobed apex, glabrous on the outer surface, slightly villose on the inner surface; stamens 10; anthers white; styles usually 3. Fruit ripening the end of September, on erect pedicels

in few-fruited clusters, subglobose to short-oblong, orange-red, 1-1.2 cm. in diameter, the calyx little enlarged with a wide deep cavity pointed in the bottom and spreading and appressed lobes; flesh thick, dry and mealy; nutlets usually 3, rounded at the ends, broader at the apex than at the base, rounded and ridged on the back, about 5 mm. long and 3 mm. wide, the narrow hypostyle extending nearly to the middle.

A shrub with stems 3-4 mm. high, and slender nearly straight glabrous unarmed branchlets bright yellow-green early in their first season, becoming light red-brown and grayish brown in their second year.

WEST VIRGINIA. Mercer County, roadside between Princeton and Mercer Springs, T. G. Harbison, No. 22 (type), May 25 and 26, 1914; No. 40, September 28, 1914.

This species in general appearance looks very distinct from the typical species of this group, but its relationship is suggested by *C. dacrioides* Sargent from Obisonia, Huntington County, southern Pennsylvania, another extreme form of *Rotundifoliae* from which it differs in its broader obovate to ovate nearly rhombic leaves destitute of hairs on the upper surface while young and smooth at maturity, smaller flowers on glabrous pedicels, by the subglobose or short-oblong not obovoid fruit and by the absence of thorns. The absence of thorns from the specimens collected by Mr. Harbison is, however, probably not a constant character.

***Crataegus meiophylla* (§ *Rotundifoliae*), n. sp.**

Leaves ovate to slightly obovate, rounded or acute at apex, cuneate at base, divided above the middle into three or four pairs of short broad rounded or acute bluntly toothed lobes, roughened above when they unfold by short white hairs, and glabrous or furnished below along the midrib and veins with occasional hairs; nearly fully grown when the flowers open, and at maturity thin, glabrous, dark yellow-green above, paler below, 2-2.5 cm. long and 1.5-2 cm. wide, with a thin prominent midrib and slender veins running to the points of the lobes; petioles slender, narrow, wing-margined to below the middle, 5-10 mm. in length; leaves at the end of vigorous shoots sometimes broad-elliptic, acute at ends, divided into acute lobes, and 4-5 cm. long and wide; petioles up to 1.5 cm. in length. Flowers appearing about May 20, 1.5 cm. in diameter, on slender pedicels in small lax slightly villose mostly 7-10-flowered corymbs; calyx-tube broad-obconic, villose, with occasional white hairs, the lobes separated by wide sinuses gradually narrowed from the base, short, acute entire or slightly or irregularly toothed, glabrous on the outer surface, villose on the inner surface; stamens 20; anthers dark rose color; styles 3-5. Fruit ripening the end of September, in drooping glabrous clusters, subglobose, dark red, 1 cm. in diameter, the calyx little enlarged with a narrow deep cavity rounded in the bottom, and spreading closely appressed lobes often deciduous from the ripe fruit; nutlets 2-4, rounded at the ends, rounded and slightly ridged on the back, 6-7 mm. long and 4-5 mm. wide, the narrow pale hypostyle extending for a third of their length.

A shrub up to 4 m. high, with stems covered with dark bark, thin gray branches armed with many slender straight or slightly curved spines 3-4 cm. long, persistent and becoming compound on old stems, and slender yellow-green glabrous branchlets.

OHIO. Harding County, Mt. Victory, *R. E. Horsey*, No. 358 (type), May 19 and September 24, 1915.

From the three other species of this group with more or less villose corymbs, twenty stamens and red or rose-colored anthers this new species differs in the shorter often rounded lobes of the much smaller leaves, shorter petioles, smaller and less villose corymbs, and in its globose not short-oblong fruit.

Crataegus Margaretta var. *Brownii* (§ *Rotundifoliae*), n. var.—*Crataegus Brownii* Britton in Bull. N. Y. Bot. Gard. i. 447 (1900).

Differing from the type in its usually narrow-oblong-obovate to elliptic leaves with acute lobes and smaller flowers and fruit.

The leaves of the type of *C. Margaretta* Ashe as it grows in the neighborhood of St. Louis, Missouri, are ovate, rounded at apex, broad-cuneate or rounded at base with short rounded lobes, and about as long as wide; the expanded flowers vary from 1.5-2 cm. in diameter, and the short-oblong fruit is about a centimeter in length. In Missouri, especially in the southern part of the state, trees occur with the typical leaves of the species growing with trees with sharply lobed leaves and smaller flowers and fruit. In northeastern Missouri, trees with broad and with narrow elliptic leaves occur in the neighborhood of Hannibal, and eastward the form with narrower acutely lobed leaves and smaller flowers and fruit is the more abundant. In the region east of the Mississippi River I have seen the typical form only from London, Ontario, from Downer's Grove, Illinois, from Lansing, and Vicksburg, Michigan, from Columbus, Mt. Victory and Delaware, Ohio, from Grant, Allen, Tipton and La Grange Counties, Indiana, and from Sweet Springs and White Sulphur Springs, West Virginia. On the type specimen of *Crataegus Brownii* from Buchanan, Botetourt County, Virginia, the leaves on the flowering branch vary from elliptic to oblong-obovate, and are not at all or only slightly lobed, and those of a fragment of what appears to be from the end of a young branch are slightly lobed with small rounded lobes. Between the type of *C. Brownii* and that of *C. Margaretta* innumerable forms occur varying in the shape of the leaves and in the size of the flowers and fruit, some of these approaching *C. Margaretta* and others *C. Brownii*, and it is impossible in the mass of material before me to find constant characters by which *C. Brownii* can be distinguished from *C. Margaretta* except as a variety. This variety is especially abundant in Allen County, Indiana, where on the east side of Lake Everett about twelve miles northwest of Fort Wayne there is a thicket of these plants some five acres in extent in which Mr. C. C. Deam has found nearly all the forms growing together.

In the east the most northern station where I have seen the variety growing is at Orbisonia, Huntington County, Pennsylvania.

***Crataegus Margaretta* f. *xanthocarpa*, n. forma.**

Differing from the species only in the bright yellow fruit.

IOWA. Harding County, Steamboat Rock, *L. H. Pammel*, No. 4 (type) September 28, 1901, No. 3719, May 24, 1902.

***Crataegus Harveyana* (§ *Intricatae*), n. sp.**

Leaves ovate, acuminate at apex, cuneate and often unsymmetrical at base, usually divided above the middle into short acute lobes, and finely doubly serrate with straight gland-tipped teeth; early in the season covered above by short white hairs, and pale and villose below along the slender midrib and primary veins, and at maturity dull yellow-green and smooth on the upper surface and paler and nearly glabrous on the lower surface, 4-5 cm. long and 3-4 cm. wide; petioles slender, narrowly wing-margined at apex, often glandular, densely villose early in the season, becoming nearly glabrous, 1-2 cm. in length; leaves at the end of vigorous shoots ovate, acute or acuminate at apex, rounded or cuneate at base, deeply-lobed, coarsely serrate, 6-8 cm. long, and 4-6 cm. wide, their petioles stout with broader margins and more numerous glands. Flowers opening the middle of May, on stout pedicels thickly covered with long white hairs, in many-flowered villose corymbs, with large oblong-obovate sparingly villose glandular bracts and bractlets; calyx-tube broad-obconic, covered with short matted white hairs, the lobes separated by wide sinuses, acuminate, laciniately glandular-serrate above the middle, sparingly villose on the outer surface, glabrous on the inner surface; stamens 20; anthers deep pink; styles 2 or 3. Fruit ripening the middle of September, subglobose, orange color, 1 cm. in diameter, the calyx little enlarged with a deep narrow cavity pointed in the bottom and spreading often deciduous lobes; flesh thin and dry; nutlets usually 3, gradually narrowed and rounded at the ends, only slightly ridged on the back, 6-7 mm. long and 5 mm. wide, the narrow dark hypostyle extending nearly to the middle.

A shrub 2-2.5 m. high, with stems covered with smooth dark bark, and slender nearly straight branchlets thinly covered early in their first season with white matted pale hairs, light red-brown and lustrous in their second season, becoming the following year ashy gray or dark brown, and armed with slender straight chestnut-brown spines 3.5-6 cm. in length.

ARKANSAS. Carroll County, rocky open woods, Eureka Springs, *E. J. Palmer*, No. 5532 (16) (type) May 10, 1914, No. 20478 (16) September 10, 1921.

This distinct species is named for Professor Le Roy Harvey who in 1883 published a catalogue of the trees of Arkansas.

***Crataegus conjungens* (§ *Triflorae*), n. sp.**

Leaves oblong-obovate, acute at apex, gradually narrowed to the concave-cuneate base, and coarsely often doubly serrate with broad acute

or rounded teeth; nearly half grown when the flowers open and then roughened above by short white hairs and slightly villose below along the midrib, and at maturity dark yellow-green and scabrate on the upper surface and pale and still sparingly villose along the midrib below, 3-4.5 cm. long and 2-2.5 cm. wide; petioles slender, slightly winged at the apex by the decurrent base of the blade, 8-10 mm. in length. Flowers opening the middle of May, 1.5-1.8 cm. in diameter, on slender slightly villose pedicels in small usually 3- or 2- or 1-flowered corymbs, the pedicel of the central flower of the 3-flowered corymb not more than one quarter the length of the others; calyx-tube narrow-obconic, villose, the lobes foliaceous, gradually narrowed from the base, acuminate, laciniately glandular-serrate above the middle, slightly villose; stamens 20; anthers white; styles 3-5. Fruit ripening the end of October, subglobose, orange-red, 1 cm. in diameter, the calyx only slightly enlarged with a short tube, a narrow deep cavity pointed in the bottom and spreading and reflexed lobes; flesh thin and dry; nutlets usually 3, rounded at the ends, broader at the apex than at the gradually narrowed base, rounded and only slightly grooved or rarely obscurely ridged on the back, 6-7 mm. long and 4-5 mm. wide.

A small shrub with slender branchlets yellow-brown and covered with white matted hairs during their first season and dark gray the following year, and armed with slender straight gray spines 1.5-3 cm. in length.

VIRGINIA. Alleghany County, gravelly hill-slopes along the James River, Clifton Forge, *T. G. Harbison*, Nos. 9 (type) and 16, May 23 and October 25, 1919.

A specimen with young fruit collected by *John K. Small* on Walker Mountain, at Shannon Gap, Smythe County, Virginia, June 20, 1892, should perhaps be referred to this species. By the shape and size of its leaves, small flowers and fruit and by its general aspect this species might be considered one of the Uniflorae to which plants with 3- or 4-flowered corymbs have been referred. The normally 3-flowered inflorescence, however, with two long and one short central pedicel, the character on which the Triflorae Group is based, is such an important one that I am inclined to refer it to that Group, considering it an intermediate and connecting link between the Uniflorae and Triflorae.

Crataegus choriophylla (§ Uniflorae), n. sp.

Leaves obovate to elliptic, acute or acuminate at apex, gradually narrowed and cuneate at the glandular base, divided above the middle into short acute lobes, and coarsely often doubly serrate with wide blunt or acute teeth; when they unfold tinged with red and covered above and on the midrib and primary veins below with short white hairs, and at maturity thick dark yellow-green, smooth and lustrous on the upper surface, paler and nearly glabrous on the lower surface, 3-4 cm. long and 2.5-3 cm. wide, with a slender midrib slightly villose toward the base of the leaf and with thin primary veins impressed on its upper surface; petioles stout, narrowly wing-margined at apex, villose early in the season, becoming

glabrous, glandular, 8-10 mm. in length; leaves at the end of vigorous shoots ovate, long-pointed and acuminate at apex, rounded at the wide base, acutely lobed above the middle, more coarsely serrate, thick and coriaceous, more lustrous on the upper surface, up to 5 cm. long and 4.5 cm. wide, their petioles stout, broad wing-margined nearly to the base, 6 or 7 mm. long. Flowers appearing early in April, about 1.5 cm. in diameter, on slender pedicels covered with long white hairs, in 1- to 5- usually 3-flowered narrow densely villose corymbs with narrow oblong-ovate glandular-serrate slightly villose bracts and bractlets; calyx-tube narrow-obconic, villose, the lobes foliaceous, narrow, elongated, acuminate, laciniately glandular-serrate, slightly villose; stamens 20; anthers white; styles 4 or 5. Fruit ripening in October, on villose pedicels, in 1- or 2-fruited clusters, subglobose to slightly obovoid, orange-red, 1-1.2 cm. in diameter, the calyx little enlarged with a deep narrow cavity pointed in the bottom and spreading and closely appressed lobes; flesh thin and dry; nutlets 4 or 5, thin and rounded at the ends, rounded and only slightly ridged on the back, 1-1.1 cm. long and 5 mm. wide, the narrow dark hypostyle extending to the middle.

"A small symmetrical tree with erect or spreading branches, bark ashy gray and shallowly furrowed" with stout nearly straight unarmed branchlets light yellow-green and conspicuously covered early in their first season with matted pale hairs, becoming nearly glabrous and dull red-brown at the end of their first season and dark gray-brown the following year.

FLORIDA. Columbia County, Lake City, in dry sandy soil, *T. G. Harbison* No. 12, June 23, 1917, Nos. 5687 (type) and 5687a, April 11 and October 8, 1920.

This plant is doubtfully referred to the Uniflorae. From the other species of that Group it differs in the broad-ovate coriaceous leaves on vigorous shoots, the more numerous-flowered corymbs, spineless branches and in its arborescent habit. Mr. Harbison who discovered it thought at one time that it might belong to the Flavae Group. "This," he writes, "is one of the most distinct looking of the genus. When I first saw it I was inclined to think that it might be a hybrid. In general appearance it does not suggest the Flavae Group. The sepals look like those of some of the Uniflorae, and the fruit is firm like the fruit of most of the species of that group."

Crataegus Croomiana (§ Uniflorae), n. sp.

Leaves obovate to rhombic, acute at apex, gradually narrowed and cuneate at base, coarsely serrate above the middle with rounded or acute teeth; roughened above early in the season by short white hairs, and sparingly villose below especially on the slender midrib and obscure primary veins, and at maturity thin, blue-green and slightly roughened above, paler and nearly glabrous below, 2.5-3 cm. long and 1.5-2 cm. wide; petioles slender, slightly winged at apex by the decurrent blade, densely

villose early in the season, becoming nearly glabrous, 3–6 mm. in length; leaves at the end of vigorous shoots broad-obovate to suborbicular, occasionally slightly lobed with short rounded lobes, more coarsely serrate, up to 3 cm. in diameter. Flowers opening the middle of April, 1 cm. in diameter, nearly sessile, solitary (on the single specimen in this herbarium), the short pedicels thickly covered with long matted white hairs; calyx broad-obconic, villose, the lobes slender, acuminate, nearly entire or lacinately glandular-serrate above the middle, villose; stamens 20; anthers rose color; styles 5. Fruit obovoid, gradually tapering to the base, 1–1.2 cm. long, 8–9 mm. in diameter, the calyx prominent with a short tube, a broad deep cavity pointed in the bottom, and spreading and reflexed much enlarged lobes; flesh thin, dry and mealy; nutlets 5, rounded at apex, gradually narrowed and acute at base, rounded and grooved on the back, 6–7 mm. long and 3 mm. wide, the narrow dark hypostyle extending nearly to the base.

A shrub 1.5–2 mm. high, with very slender branchlets covered early in the season with matted pale hairs, dull red-brown and slightly pubescent, becoming glabrous in their second season, and ashy gray and glabrous the following year, and armed with numerous slender dark chestnut brown spines 2–4 cm. in length.

FLORIDA. Leon County, upland woods in sandy soil near, Tallahassee, T. G. Harbison Nos. 5710 (type) and 5710a, April 15 and October 6, 1920.

This species generally resembles *C. uniflora* Moench, the type of the Group, which differs from the Tallahassee plant by its usually more pubescent leaves, yellow anthers, subglobose rarely slightly obconic fruit with a more enlarged calyx. It is named for Henry B. Croom, a native of Newbern, North Carolina, who for many years visited his plantations in western Florida every winter, and in 1833 discovered *Torreya* on the bank of the Appalachicola River, and who wrote and published papers on the flora of the southern states.

Crataegus Victorinii (§ *Macracanthae*), n. sp.

Leaves ovate to oval or obovate, rounded and short-pointed or acute at apex, abruptly concave-cuneate at base, often slightly and irregularly lobed with acuminate lobes, and sharply doubly serrate usually only above the middle with straight teeth; nearly fully grown when the flowers open and then glabrous with the exception of a few hairs on the upper side of the midrib, and at maturity thin, glabrous, dull dark green on the upper surface, paler on the lower surface, 3.5–4 cm. long and 2.5–3 cm. wide, with a stout midrib and prominent veins impressed above; petioles stout, narrow, wing-margined to the middle, glabrous, 1–1.5 cm. in length; leaves on vigorous shoots obovate, rounded at apex, more acutely cuneate at base, lobed with longer acuminate lobes, 4.5–5 cm. long and 3–4 cm. wide. Flowers opening early in June, 1.5 cm. in diameter, on long slender pedicels in wide 10–25-flowered glabrous corymbs; calyx-tube

broad-obconic, glabrous, the lobes separated by wide sinuses, laciniately glandular-serrate, glabrous on the outer surface, puberulous on the inner surface; stamens 10; anthers rose color; styles 2-5. Fruit ripening the middle of September, on slender drooping pedicels in many-flowered clusters, subglobose, scarlet, lustrous, 8-10 mm. in diameter, the calyx little enlarged with a short tube, spreading and reflexed lobes, and a deep narrow cavity pointed in the bottom; flesh thick and succulent; nutlets 2-5, rounded at apex, narrowed at base, only slightly grooved on the back, penetrated on the inner face by narrow shallow grooves, the narrow dark hypostyle extending to about the middle.

A round-topped tree 4-5 m. high, with yellow-green bark and stout glabrous branchlets very rarely furnished with stout nearly straight chestnut-brown spines 5 cm. long or entirely spineless, yellow-green when they first appear, becoming chestnut-brown, lustrous and marked by pale lenticels at the end of their first season and dark red-brown the following year.

CANADA. Province of Quebec, Longueuil, opposite Montreal, in the grounds of College Longueuil *Brother Victorin*, No. 27 (type), June 4 and September 22, 1913; Outremont, Montreal Island, *Brother Victorin*, No. 31, May 29 and September 11, 1914.

Glabrous species in the *Macracanthae* are rare. On page 10 of this volume of the Journal one of these, *C. nuda* Sarg. of southern Missouri, was described and of the eastern species previously described only one, *C. bristoliensis* Sargent from southern Massachusetts, has ten stamens and rose-colored anthers. The other species have yellow anthers. From *C. bristoliensis* this new species differs in its larger, thinner and more deeply and regularly lobed acuminate leaves, in its narrow calyx-lobes, in its ellipsoidal to obovoid fruit, and in its more numerous spines.

Crataegus carrollensis (§ *Macracanthae*), n. sp.

Leaves ovate to rarely obovate, acuminate at apex, abruptly or gradually narrowed and concave-cuneate at base, slightly and irregularly divided usually only above the middle and coarsely often deeply serrate with straight gland-tipped teeth; more than half grown when the flowers open and then covered above with short white hairs and slightly villose below especially on the midrib and veins, and at maturity thin, yellow-green, smooth, lustrous and glabrous above, still villose below, 7-10 cm. long and 5.5-7 cm. wide, with a stout midrib and slender primary veins; petioles stout, wing-margined toward the apex by the decurrent leaf blade, densely villose early in the season, becoming pubescent in the autumn 2-2.5 cm. in length. Flowers (only buds seen) in many-flowered corymbs, densely covered with matted white hairs, with conspicuous oblong-obovate to linear-lanceolate bracts and bractlets; calyx-tube narrow-obconic, villose, the lobes narrow-acuminate, laciniately glandular-serrate, sparingly villose or glabrous on the outer surface, glabrous on the inner surface; stamens 15-20; anthers pale yellow; styles 2 or 3. Fruit ripening pro-

bably in October, on stout glabrous pedicels, ellipsoidal, dark red, the calyx with a short tube, spreading and reflexed lobes and a shallow wide cavity pointed in the bottom, 6 or 7 mm. long and 5 or 6 mm. wide; nutlets 2 or 3, acute at apex, rounded at base, slightly grooved on the back, penetrated on the inner face by short grooves, 5 mm. long and 3 mm. wide, with a narrow hypostyle extending to the middle.

A stout shrub 2-3 m. high, covered with gray scaly bark, thick erect pale gray branches and stout branchlets yellow-green and sparingly covered with pale hairs when they first appear, becoming red-brown and glabrous in their second season and armed with numerous stout straight chestnut brown lustrous spines 4-6.5 cm. long, becoming branched and persistent on old stems.

ARKANSAS. Carroll County, rocky hillsides, Eureka Springs, *E. J. Palmer*, No. 5521 (type), September 23, 1913, No. 5521, May 9, 1914.

Crataegus kingstonensis (§ *Anomalae*), n. sp.

Leaves elliptic to broad-ovate, acuminate at apex, gradually narrowed and cuneate or rarely rounded at base, divided toward the apex into short acuminate spreading lobes, and coarsely often doubly serrate above the middle with straight glandular teeth, thin, glabrous, dark yellow-green, smooth and lustrous above, pale or glabrous below, 5-7 cm. long and 4-5 cm. wide, with a slender midrib and primary veins; petioles slender, 1-1.5 cm. in length. Flowers opening early in June on long slender pedicels in lax mostly 7-10-flowered glabrous corymbs; calyx-tube broad-obconic, glabrous, the lobes gradually narrowed from the base, acuminate, sharply serrate or entire, glabrous on the outer surface, puberulous on the inner surface; stamens 20; anthers bright red; styles 4 or 5. Fruit ripening the middle of October, subglobose, about 1.5 cm. in diameter, dark red, with soft succulent flesh; the calyx little enlarged with spreading appressed lobes and a deep narrow cavity rounded in the bottom; nutlets 4 or 5, rounded at the ends, ridged on the back with a low grooved ridge, obscurely grooved on the inner faces, 6-7 mm. long and 5-6 mm. wide, the narrow hypostyle extending to the middle.

A tree 7-8 m. high, with a trunk 2 m. long, and stout glabrous branchlets yellow-green when they first appear, becoming dark chestnut brown and lustrous by the end of the first season and dull red-brown the following year, and armed with many stout nearly straight chestnut-brown spines 3-4 cm. in length.

CANADA. Province of Ontario, near Kingston, *J. Dunbar*, No. 113 (type) and No. 117, October 19, 1911, June 6, 1912.

This is an interesting addition to the small number of *Anomalae* with glabrous corymbs and 20 stamens. It is most closely related to *C. fallsiana* Sarg. from Little Falls, Herkimer County, New York, with the same shaped leaves and the same succulent fruit, but the flowers and fruit of the Kingston tree are much larger. The two species are more

distinct in the roughness of the upper surface of the leaves of the New York plant at the time the flowers open, caused by the bases of the hairs which cover it as the leaves unfold, those of *C. kingstonensis* being always glabrous.

Betula neoalaskana, n. nom.—*Betula alascana* Sargent in Bot. Gaz. xxxi. 236 (1901), not Lesquereux in Proc. U. S. Nat. Mus. v. 446 (1883).

Dr. C. V. Piper calls my attention to this earlier use of the name *Betula alaskana* for a fossil tree necessitating a new name for the existing species.

Gleditsia texana Sargent.

This species was based on a grove of trees growing near Brazoria in the valley of the lower Brazos River in Texas. When these trees were described in 1901 only the Brazoria trees were known but since 1901 specimens of what is evidently the same tree have been collected on the banks of the Red River near Shreveport, Louisiana, at Yazoo City, Mississippi, and by a roadside $\frac{1}{2}$ mile west of Skelton, Gibson County, Indiana (C. C. Deam No. 35,123, September 27, 1921). On the Brazos River *G. texana* grows in company with *G. triacanthos* Linnaeus and *G. aquatica* Marshall and these species occur in the other localities where this tree has been met with; and as only a few individuals have been found in widely scattered localities there seems every reason to believe that *G. texana* is a hybrid of *G. triacanthos* and *G. aquatica*.

The trees have the habit of *G. triacanthos* and the branches of the Texas tree are unarmed but those from Louisiana are furnished with stout simple spines and on the Indiana tree the spines are stout or compound. The leaves of these trees resemble those of *G. triacanthos*, but they all have short thin walled fruit without the pulp of that species and in this resemble *G. aquatica*. On one of the Louisiana specimens the fruit varies in length from 6–11 cm. The longest of these fruits have the straight margins and the rounded base of that of *G. triacanthos*, on some of the shortened fruits the margins are more or less contracted between the seeds and the shortest are one-seeded and generally narrowed into a long cuneate base. The length of the fruits of the Mississippi specimen collected by S. M. Tracy are 10 cm. long with a rounded base, deeply contracted between the three seeds and the shorter is 4 cm. long with a stipe-like base and one seed.

Thomas Nuttall landed in January 1819, on an island in the Mississippi River near the mouth of White River, Arkansas "and for the first time recognized the short podded, honey-locust (*Gleditsia brachycarpa*), a distinct species, intermediate with the common kind (*G. triacanthos*) and the one-seeded locust (*G. monosperma*), differing from *G. triacanthos* in the persisting fasciculated legumes, as well as in their shortness and want

of pulp." (Travels into the Arkansas Territory p. 63). A few days later he saw the three *Gleditsias* growing together on the banks of the lower Arkansas River. Judging by the locality Nuttall's *G. brachycarpa* is the hybrid of *G. texana* and not the *G. brachycarpa* of Pursh which was from the mountains of Southwestern Virginia a region far beyond the range of *G. aquatica*. As a synonym of his species Pursh quotes *G. triacanthos brachycarpus* of Michaux for which Michaux gave no locality.

NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM¹

ALFRED REHDER

Juniperus squamata var. *Meyeri*, var. nov.

A typo recedit habitu erecto vel ascendente foliis dorso eximie glaucis. Frutex humilis, ramis erectis vel ascendentibus dense ramulosis ramulis brevibus erectis vel suberectis; internodia breviter pallide luteo-viridia; folia lineari-lanceolata, 6–10 mm. longa, circiter 1.5 mm. lata, a medio in apicem spinulosam sensim attenuata, dorso fere ad apicem leviter sulcata, ventre fasciis duobus albis stomatiferis notata, nervo medio leviter elevato glauco; fructus plerique ad basin ramulorum, erecti, pedunculo brevissimo dense bracteato suffulti, ovoideo-oblongi, circiter 6 mm. longi (ut videtur non bene evoluti et steriles) medio squamulorum apicibus liberis triangularibus plerumque 3 instructi, apice depressi, atro-brunnei, demum fere atri, levissime pruinosi; semen conico-ovoideum acutum et apiculatum, 2–3-costatum.

Cultivated at the Arnold Arboretum (plants received from Hick's Nursery as "Meyer's Juniper;" specimens collected October 3, 1919, September 15, 1922 (type); U. S. Department of Agriculture, S. P. I. No. 23023, comm. *H. C. Skeels*, November, 1921.

This Juniper was found by Frank N. Meyer in Tientsin, Chili, grown by the Chinese as a pot plant and supposed to have come from southwestern Shantung. The Chinese graft it on *Thuja orientalis*; how this is done is shown by Meyer's photograph No. 12258 taken near Shin yeh, Honan; an older plant of this variety is shown in his photograph No. 12407, taken at Peking. This Juniper is a very handsome form on account of its striking blue-white color and its dense habit. From the commonly cultivated form of *J. squamata* Lambert it is chiefly distinguished by the dense upright or ascending habit and by the bluish white longer leaves. It has proved perfectly hardy at the Arnold Arboretum and fruited this year for the first time, though the seeds were sterile.

¹Continued from p. 51.

Juniperus lucayana var. *bedfordiana*, comb. nov.—*Juniperus Bedfordiana* Loudon, Trees & Shrubs, 1090 (1842), nomen.—Henry in Elwes & Henry, Trees Gt. Brit. Irel. vi. 1437 (1912).—*J. gracilis* Endlicher, Syn. Conif. 31 (1847).—*J. virginiana Bedfordiana* Hort. apud Knight & Perry, Syn. Conif. 12 (1850), nomen.—Parlatore in DeCandolle, Prodr. xvi. 2, 489 (1868), as var.—Veitch, Man. Conif. 284 (1881); Kent Veitch's Man. Conif. ed. 2, 193 (1900).—Koehne, Deutsch. Dendr. 54 (1893), as forma.—*Juniperus virginiana gracilis* Sargent, Silva N. Am. x. 96 (1896).

This form which is usually referred to *J. virginiana* as a form or variety is apparently a juvenile form of *J. lucayana* Britton; and Gordon and some other authors have already united it with *J. barbadensis* Auth., not Linnaeus (*J. virginiana barbadensis* Gord.), which is a synonym of *J. lucayana*. It differs from the type of that species in its acicular leaves; from juvenile forms of *J. virginiana* it may be distinguished by its slenderer pendulous branchlets, slenderer and rather longer leaves and by its tenderness in northern latitudes where *J. virginiana* is hardy. I suspect, however, that at least some of the Junipers grown in European gardens as *J. bedfordiana* and reported to be hardy in northern and middle Europe are forms of *J. virginiana*.

Pinus nigra Arnold var. *cebennensis*, comb. nov.—*P. Laricio* Lapeyrouse, Hist. Pl. Pyrén. ii. 588 (1813), not Poiret.—*P. pyrenaica* Lapeyrouse, Hist. Fl. Pyrén. Suppl. 146 (1818), in part, only as to the locality cited.—Loudon, Arb. Brit. iv. 2209 (1838), in part.—Hort. apud Carrière, Traité Gén. Conif. 390 (1855), as synon. of *P. Salzmanni*.—*P. Laricio* var. *pyrenaica* Loudon, Arb. Brit. iv. 2202 (1838), in part.—Godron in Grenier & Godron, Fl. France, iii. 153 (1855), excl. syn. *P. pyrenaica* Lap.—*P. Salzmanni* Dunal in Mém. Acad. Montpell. ii. 81, tab. 12 (1851).—*P. monspeliensis* Salzmann ex Dunal, l. c. 83 (1851), as synon.—*P. Laricio* var. *cebennensis* Godron in Grenier & Godron, Fl. France, iii. 153 (1855).—Rehder in Bailey, Cycl. Am. Hort. iii. 1355 (1901).—*P. ebenensis* Hort. ex Gordon, Pinetum, ed. 2, 239 (1875), as synon. of *P. Laricio*.—*P. Laricio* var. *leptophylla* Christ in Bot. Zeit. xxiii. 230 (1865).—*P. Laricio* var. *tenuifolia* Parlatore in DeCandolle, Prodr. xvi.² 387 (1868).—*P. Laricio* var. *Salzmanni* Richter, Pl. Eur. i. 2 (1890).—*P. Laricio* var. *monspeliensis* Koehne, Deutsch. Dendr. 38. (1893).—*P. nigra Salzmannii* Ascherson & Graebner, Syn. Mitteleur. Fl. i. 215 (1897).—*P. cebennensis* Hort. ex Rehder in Bailey, Cycl. Am. Hort. iii. 1355 (1901), as synon.—*P. horizontalis* Hort. ex Rehder, l. c. (1901), as synon., not Roegl.—*P. nigra leptophylla* Ascherson & Graebner, Syn. Mitteleur. Fl. i. ed. 2, 333 (1912).—Teuscher in Mitteil. Deutsch. Dendr. Ges. xxxi. 103 (1921).—*P. nigra* var. *tenuifolia* Schneider in Silva-Tarouca, Uns. Freiland-Nadelh. 262 (1913).

The oldest available varietal name of this variety is apparently *P. Laricio* var. *cebennensis* Godr. *Pinus Laricio* var. *pyrenaica* Loud., though

partly referable to this variety, is based, as its name indicates on *P. pyrenaica* Lapeyrouse which belongs to *P. halepensis* Mill. or more especially to its var. *brutia* A. Henry (*P. brutia* Ten.). This is clearly stated by H. de Vilmorin (in Bull. Soc. Bot. France, XL. LXXVII. [1893]; see also Ascherson and Graebner, Syn. Mitteleur. Fl. I. 219), who shows that Lapeyrouse in 1813 under *P. Laricio* described and under stood a variety of *P. Laricio* found in the Pyrenees, while in 1818 in the Supplement he published under the name *P. pyrenaica* a new description based on a tree growing in his park near Toulouse and supposed by him to be the same as his *P. Laricio* from the Pyrenees. The tree in his park, however, was not the Pine from the Pyrenees, but *P. halepensis* var. *brutia* A. Henry, probably raised from seed received from the Orient

Potentilla fruticosa var. **Purdomii**, var. nov.

A typo recedit praecique foliolis minoribus, 7–10 mm. longis, subtus glaucescentibus ad costam sparse longe pilosis ceterum glabris vel fere glabris floribus pallide luteis.—Frutex erectus ramis tenuibus elongatis laxe pilosis; folia 5-foliolata; foliola elliptico-oblonga vel obovato-oblonga, acuta, margine leviter revoluta, supra obscura viridia laxe longe adpresse pilosa: flores 1–1.8 cm. diam. in corymbis plurifloris; bractee calycinae oblongo-oblancoelatae, sepalis subaequilongae; stamina circiter 25, stylis paullo longiora.

Cultivated at the Arnold Arboretum, raised from seed collected by W. Purdom in southern China and sent under Seed No. 848 in 1911; specimen collected September 6, 1922.

Though this form of *Potentilla fruticosa* L. differing chiefly in the smaller leaflets glaucescent and nearly glabrous beneath and in the pale yellow flowers, is not strikingly different from the type and some of its variations, it cannot be referred to any of the forms described, and is therefore proposed here, though reluctantly in this polymorphous species, as a new variety.

Rosa Maximowicziana var. **Jackii**, comb. nov.—*R. coreana* Keller in Bot. Jahrb. XLIV, 47 (1909), not *R. koreana* Komarov.—*R. Kelleri* Baker in Willmott, Gen. Rosa, I. 75 (1910), not Dalla Torre & Sarntheim.—*R. Jackii* Rehder in Mitteil. Deutsch. Dendr. Ges. XIX, 259 (1910) ; in Bailey, Stand. Cycl. Hort. v. 2998 (1916).—*R. Maximowicziana* Nakai, Fl. Sylv. Kor. VII. 26, t. 3 (1918), only as to tab. 3.

This Rose differs from typical *R. Maximowicziana* only in the absence of the prickles on the stems and branches which are numerous at least on the more vigorous shoots in the type. When I described *R. Jackii* I knew *R. Maximowicziana* Regel only from the description, and as the species was described as a dense upright shrub, the branches and branchlets armed with prickles and bristles, I concluded that it must be an entirely different plant. Since then, however, we have received material of typical *R. Maximowicziana* from Manchuria as well as from Korea and find that the habit is not upright, but sarmentose as correctly described by Nakai,

who figures typical *R. Maximowicziana* on plate 1 of part VII of his *Flora sylvatica koreana*. The only difference which remains now between the two forms is the absence of bristles on the stems and branches in *R. Jackii* which certainly cannot be considered a specific difference.

***Rosa omeiensis* f. *chrysocarpa*, forma nov.**

A typo recedit fructu luteo majore.—Frutex ramis aculeis basi valde dilatatis armatis, turionibus insuper dense aciculate-setosis: folia ramulorum pleraque 5-juga, turionum 6-7-juga foliolis glabris; fructus stipite carnosio parti superiori subaequilongo incluso circiter 2 cm. longus et 11-12 mm. diam.

Raised from seed sent from western China by E. H. Wilson to the Arnold Arboretum in 1908 or 1910; specimens collected in Hort. H. S. Hunnewell, Wellesley, Massachusetts, by Mrs. S. D. McKelvey, August 8, 1922. (type).

This form differs in its bright yellow fruits from typical *R. omeiensis* Rolfe which has the fruits entirely red or sometimes red with the stalk-like stipe colored orange. The lighter and brighter color of the larger fruits makes this form even more conspicuous at fruiting time than the red-fruited type, though unfortunately the fruit of *R. omeiensis* which ripens early in July and a month later in the yellow-fruited form drops soon after ripening and therefore the display does not last long.

***Hamamalis virginiana* L. f. *rubescens*, forma n.**

A typo recedit petalis praesertim basin versus rubescentibus.

Originated at the Arnold Arboretum; type specimen collected Oct. 31, 1921, C. Vandervoet.

This form differing in the light red flowers from the type was first noticed in the autumn of 1921 by Mr. C. Vandervoet on an old plant probably brought from the woods in eastern Massachusetts and now growing in this Arboretum. When in full bloom this red-flowered form contrasts conspicuously with the typical form with its pale yellow flowers. The form is, however, not entirely new, for a shrub with light red flowers had been observed more than 30 years ago near Malden, Massachusetts, by Edward L. Rand (Sargent, *Silva N. Am.* V. 4, [1893]).

In the color of its flowers *H. virginiana* f. *rubescens* resembles the Japanese *H. incarnata* Makino, a species flowering in winter and early spring closely related to *H. japonica* Sieb. & Zucc., but in that species the sepals are deep red on the inner surface, while in our form they are yellowish green to brownish green.

Skimmia Reevesiana* Fortune, Journ. Tea Countr. China, 329 (1852).—*S. japonica* Lindley in Paxton's Flow. Gard. II. 56, fig. 163 (1851), not Thunberg, except Zuccarini's description; in Gard. Chron. 1852, 183.—Fortune in Gard. Chron. 1852, 739, 789.—Hooker in Bot. Mag. LXXIX. t. 4719 (1853), exclusive of synonyms.—Carrière in Rev. Hort. 1869, 259, fig. 60.—Engler in Engler & Prantl, Nat. Pflanzenfam. III. Abt. 4, 181 (1897), in part.—Pritzel in Bot. Jahrb. XXIX. 424 (1900).—*S. Fortunei

Masters in Gard. Chron. ser. 3, v. 520, fig. 9 (1889).—Dippel, Handb. Laubholz. II. 356, fig. 165 (1892).—Rehder in Bailey, Cycl. Am. Hort. IV. 1671 (1902).—Schneider, Ill. Handb. Laubholz. II. 127, fig. 80c, 81 l-m (1907).

The name given by Fortune to the Chinese *Skimmia* introduced by him in 1849 to England seems to have been entirely overlooked. Though he does not give a technical description of his new species, he states that it is the *S. japonica* as described by Lindley and thus bases his name on a definite description. The change in the name of this species makes necessary the following new combination:

Skimmia Reevesiana f. *rubella*, comb. nov.—*S. intermedia* Carrière in Rev. Hort. 1870, 200; 1874, 311.—Nicholson, Ill. Dict. Gard. III. 440 (1887).—*S. rubella* Carrière in Rev. Hort. 1874, 311, tab.; 1880 57, fig. 12; 1885, 189, fig. 35.—*S. Fortunei* f. *rubella* Voss, Vilmorin's Blumen-gärt. I. 172 (1894).—Rehder, in Bailey, Cycl. Am. Hort. IV. 1671 (1902), as var.

This form differs from the type chiefly in its reddish peduncles, pedicels and flower buds. It was first described by Carrière as *S. intermedia* and stated to be of unknown origin, but four years later he described and figured it as *S. rubella* and stated that it was introduced from China about 1865 by Eugène Simon. Carrière describes it as intermediate between *S. japonica* and *fragrans* which is according to our present nomenclature *S. Reevesiana* and *S. japonica*, but its hybrid origin seems very doubtful.

Skimmia Reevesiana f. *variegata*, comb. nov.—*S. japonica variegata* Anon. in Gard. x. 364 (1878).—Mouillefert, Arb. Arbriss. I. 214 (1891).—*S. japonica argentea variegata* Nicholson, Ill. Dict. Gard. III. 441 (1887).—*S. Fortunei* var. *argentea* Masters in Gard. Chron. ser. 3, v. 553 (1889).
A form with the leaves bordered white.

× *Skimmia Foremanii* Knight in Florist & Pomol. 1881, 70 (as *S. Foremanni*)—(*S. japonica* × *Reevesiana*).—Masters in Gard. Chron. ser. 3, v. 553 (1889).—Bean, Trees and Shrubs Brit. Isles, II. 514 (1914).—*S. intermedia* Rehder in Bailey, Cycl. Am. Hort. IV. 1671 (1902), not Carrière.—Schneider, Ill. Handb. Laubholz. II. 127 (1907).

This form is according to Knight a hybrid between *S. japonica* and *S. oblata* (= *S. Reevesiana* × *japonica*) raised by Mr. Foreman of Dalkreith. It was first exhibited in Edinburgh at the Spring Meeting of the Royal Caledonian Horticultural Society in 1881, and was awarded a First-class certificate. As Masters points out, the occurrence of two forms of fruit in the same panicle and their color indicates the hybrid origin of the plant.

× *Skimmia Foremanii* var. *Rogersii* comb. nov.—*S. Rogersii* Masters in Gard. Chron. ser. 3, v. 553 (1889).

This form was discovered about 1878 by W. H. Rogers of Southampton among seedlings of *S. oblata*, but shows the influence of *S. Reevesiana*

in its hermaphrodite flowers and the crimson color of its depressed-globose berries.

Cotinus coggygia f. *purpureus*, comb. nov.—*Rhus Cotinus purpureus* Dupuy-Jamain in Rev. Hort. 1870–71, p. 567.—*Rhus Cotinus atropurpurea* Burvenich in Rev. Hort. Belg. xi. 257 (1885).—Voss, Vilmorin's Blumen-gärt. i. 190 (1894), as forma.—*Cotinus coccygea* var. *atropurpurea* Dippel, Handb. Laubholzk. ii. 382 (1892).—*Cotinus coggygia* f. *atropurpurea* Schneider, Ill. Handb. Laubholzk. ii. 146 (1907).

This form differs from the type in the deep purple color of the hairs of its fruiting panicle. The form mentioned in Garden, lxxxv. 283 (1921) under the name *Rhus Cotinus purpureus* and described as having purple leaves, is unknown to me, but if it is distinct from *R. Cotinus purpureus* Dupuy-Jamain, as it appears to be, it should receive a new name.

× *Ilex Beanii*, nom. nov. (*I. Aquifolium* × *dipyrena*).—*I. Aquifolium* var. *elliptica* Nicholson in Kew Hand-list Arb. i. 57 (1894), nomen.—*I. Aquifolium* var. *flammea angustifolia* ex Nicholson, l. c. (1894), as synonym.—*I. dipyrena* var. *elliptica* Dallimore, Holly, Yew & Box, 124 (1908).—*I. elliptica* Bean, Trees & Shrubs Brit. Isles, i. 647 (1914), not Humboldt, Bonpland, Kunth.

SPECIMEN EXAMINED: Kew Arboretum, cultivated, W. J. Bean, November 27, 1920.

As the name *I. elliptica* is preoccupied by the Peruvian *I. elliptica* Humboldt, Bonpland & Kunth, Nov. Gen. Spec. vii. 54 (70) (1825), this interesting *Ilex* may bear the name of Mr. W. J. Bean who first pointed out that it is very likely a hybrid between *I. Aquifolium* L. and *I. dipyrena* Wall.

Ilex vomitoria Aiton, Hort. Kew. i. 170 (1789).—Trelease in Gray, Syn. Fl. i, pt. 1, 389 (1897).—Sargent, Sylva N. Am. i. 111, t. 48 (1891); Man. ed. 2, 671, p. 605 (1922).—*I. Cassine* β. Linnaeus, Spec. i. 125 (1753).—*Cassine Peragua* Linnaeus, l. c. 268 (1753) in part, as to the second native country "Carolina".—*Prinos glaber* Linnaeus, Spec. ed. 2, i. 471 (1762), in part, as to both synonyms.—*Cassine Paragua* Miller, Dict. Gard. i. no. 2 (1768).—*Cassine caroliniana* Lamarck, Encycl. Méth. i. 652 (1782), as to the synon. "Bauh. Pin. 170".—*Ilex Cassine* Walter, Fl. Carol. 241 (1788), not Linnaeus.—Watson, Bibl. Ind. N. Am. Bot. i. 157 (1878).—*I. floridana* Lamarck, Tabl. Encycl. Méth. i. 356 (1791).—Poiret, Suppl. Encycl. Méth. iii. 67 (1813).—*I. Cassena* Michaux, Fl. Bor.-Am. ii. 229 (1803).—*I. religiosa* Barton, Fl. Virg. 66 (1812).—*Hierophyllum Cassine* Rafinesque, Med. Fl. ii. 8 (1830).—*Ageria Cassena* Rafinesque, l. c. 47 (1838).—*Oreophila myrtifolia* Scheele in Roemer, Texas, 432 (1849), not Nuttall¹.—*I. Peragua* Trelease in Trans. St. Louis

¹ This synonym is marked with a query by Watson and Loesener, but as *I. vomitoria* grows near Houston and is the only evergreen shrub there which has a close resemblance to *Oreophila myrtifolia* Nuttall = *Pachistima myrsinites* Raf., there can be little doubt that Scheele's name should be referred here.

Acad. Sci. v. 346 (1889), excl. synonym. *Cassine Peragua* L.—*I. Caroliniana* Loesener in Bot. Centralbl. XLVII. 163 (1891); in Nov. Act. Leop.-Carol. Akad. LXXVIII. 341 (Monog. Aquifol.) (1908), excl. synonym. *Cassine caroliniana* Lam. not Miller, nor Trelease²).

Though a large number of names have been bestowed on the plant best known as *Ilex vomitoria* Aiton, the oldest specific name given to it seems to have escaped notice and is not enumerated in Index Kewensis. This is Miller's *Cassine Paragua* of 1768; Miller cites in his short description the figure published in his Figures of the most beautiful . . . plants (i. 55, t. 83, fig. 2 [1760]), where he also quotes Catesby's plate (Nat. Hist. Car. II. 57 [1743]), and the "*Cassine vera Floridanorum arbuscula baccifera*, Alaterni (not "alterni" as printed in Linnaeus' Spec.) ferme facie" of Plukenet (Mant. 40 [1700]). All these quotations belong to *I. vomitoria* Aiton without any extraneous element being involved. There could be, therefore, no doubt of the validity of Miller's name if it were not for the name *Cassine Peragua* Linnaeus (Spec. i. 268 [1753])³, which should be considered a homonym, as the difference in the spelling is too slight to make them different names. If we reject the name *C. Paragua* Miller as being a homonym of *C. Peragua* Linnaeus the question arises if *Cassine caroliniana* Lamarck should be taken up as the next oldest name, as was done by Loesener who made in 1891 the combination *Ilex caroliniana*.

² The following names referred by some authors as synonyms to *I. vomitoria* should be excluded:

I. ligustrina Jacquin, Icon. Pl. Rar. II. 9, t. 310 (1789?); Collect. IV. 105 (1790).—This is a distinct species and is treated as such by Loesener; the native country is given by Jacquin as "Carolina," but that is probably an error (see Loesener in Nov. Act. Leop.-Carol. Akad. LXXVIII. 319, obs. 2 [Monog. Aquifol.] [1901]).

Winterlia triflora Moench, Meth. 74 (1794). K. Koch (Hort. Dendr. 211 [1853] and Dendr. II. pt. 1, 225 [1875] where he cites the name by mistake as *Winterlia glabra*) and Trelease (in Gray, Syn. Fl. II. pt. 1, 390 [1897]) are apparently right in referring this name to *Ilex glabra* as a synonym. Moench's specific description agrees well with *I. glabra* Gray but in his generic description he characterizes the flowers as 4-merous, and this probably induced Loesener to cite the name as a synonym with a query under his *I. caroliniana*=*I. vomitoria* Ait., though "petalis linearibus . . . sepala . . . petalis breviora" hardly fits that species.

Cassine ramulosa Rafinesque Fl. Ludov. 110 (1817).—This plant can hardly belong to *Ilex vomitoria*, as it is described as having 5-merous flowers and a 3-celled ovary with 3 reflexed stigmas.

Ilex (Emetila) ramulosa Rafinesque, Sylv. Tellur. 45 (1838). This is the same as the preceding plant.

Ageria geminata Rafinesque Sylv. Tellur. 48 (1838). As the leaves are described as acute, thin and deciduous, the peduncles as "unifloris geminatis sparsis" and the habitat given as "Apalachian Mts.", it can hardly represent *Ilex vomitoria*.

³ *Cassine peragua* Linnaeus, Spec. i. 268 (1753) a citation not given in Index Kewensis is to be considered a valid name and antedates *C. capensis* Linnaeus, Mant. 220 (1771) with which it agrees in its principal elements, that is in the figures cited (see also Loesener in Bot. Jahrb. XXVIII. 155 [1891]). The plant, however, called *C. peragua* by Linnaeus in 1771 (Mant. 220) represents *Viburnum obovatum* Walter (Fl. Carol. 116 [1788]) for which the oldest name is *Cassine corymbosa* Miller of 1768, see foot-note 5.

In doing so he apparently overlooked the existence of two older homonyms namely *Ilex caroliniana* of Miller (1768) and of Trelease (1889). According to the International Rules the first of the two homonyms could not invalidate Loesener's combination, as Miller's name is a synonym of *Ilex Cassine* L., but Trelease's name is to be accepted under the International Rules as a valid name⁴. Aside from this, however, another reason why *I. caroliniana* Loesener should be rejected, is the fact that *Cassine caroliniana* Lamarck belongs only partly to *Ilex vomitoria*, as Lamarck confused under *Cassine caroliniana* two entirely different plants namely *Ilex vomitoria* Aiton which having 4-merous flowers would not belong in his genus *Cassine* at all and *Viburnum obovatum* Walter. As the description seems to be chiefly based on Miller's *Cassine corymbosa*⁵ and on the figure representing that species which is identical with *Viburnum obovatum*, *Cassine caroliniana* should be referred according to its chief component as a synonym to the latter species. Therefore *Ilex caroliniana* Loesener, being based on a species the type of which is identical

⁴*Ilex caroliniana* Trelease in Trans. Acad. Sci. St. Louis, v. 347, (1889).—*Cassine caroliniana* Walter, Fl. Carol. 242 (138).—*Prinos ambiguus* Michaux, Fl. Bor.-Am. II. 236 (1803).—*Synstima acuminata* Rafinesque, Sylv. Tellur. 48 (1838).—*Synstima caroliniana* Rafinesque l. c. 49 (1838).—*Ilex ambigua* Chapman, Fl. S. U. S. 269 (1860).—*Nemopanthes ambiguus* Wood, Classb. Bot. Fl. U. S. Can. 497 (1861).—*Synstima ambigua* Rafinesque "Sylv. Tellur. 48" apud S. Watson, Bibl. Ind. N. Am. Bot. 157 (1878).

According to the Philadelphia Code Trelease's combination is invalidated by the older homonym *Ilex caroliniana* of Miller, but that being a synonym of *Ilex Cassine* does not prevent the acceptance of *Ilex caroliniana* Trelease under the International Rules. Neither could Walter's *Cassine caroliniana* be rejected as non-valid on account of the older homonym of Lamarck, which as pointed out below is a synonym of *Viburnum corymbosum* Rehd. (*V. obovatum* Ait.). The point, however, may be raised, if a tentative proposition of a name as in this case where Trelease says under *Ilex ambigua* in a note: "If this specific name (*Cassine caroliniana* Walter) is to be accepted, the plant becomes *I. caroliniana* (Walt.)" should be considered a valid publication. There is nothing in the Rules which covers this point exactly, but the tendency is to accept such names, and therefore, I think, we have to accept *I. caroliniana* Trelease as the valid name for *I. ambigua* Chapman.

⁵*Cassine corymbosa* Miller, has been referred in Index kewensis as a synonym to *Ilex Cassine*, but a glance at Miller's description and the figure and the synonyms cited that it is identical with the plants described later by Aiton as *Viburnum laevigatum* and by Walter as *V. obovatum*. As Miller's name antedates these two names the following new combination becomes necessary.

Viburnum corymbosum, comb. nov.—*Cassine corymbosa* Miller, Gard. Dict. i. no. 1 (1768).—*Cassine peragua* Linnaeus, Mant. 222 (1771).—*Cassine caroliniana* Lamarck, Encycl. Méth. I. 652 (1783), excl. syn. "Bauh. Pin." and remarks.—*Viburnum obovatum*, Walter, Fl. Carol. 116 (1788).—*Viburnum laevigatum* Aiton, Hort. Kew I. 371 (1879).—*Ilex Peragua* Trelease in Trans. St. Louis Acad. Sci. v. 346 (1889), as to the synonym *Cassine peragua* L.—*Ilex caroliniana* Loesener, Bot. Centralbl. XLVII. 163 (1891), as to the synonym *Cassine caroliniana* Lam.

Though the figure published by Miller (Fig. Pl. I. 55, t. 83, fig. 1. [1760]) and cited under his *Cassine corymbosa* is not exactly typical for the species in question, it cannot be referred to any other species than *Viburnum obovatum* Walter, which was in cultivation in England since 1724 and we have under the present rules no choice but to use the oldest specific name, even if published under an entirely wrong genus.

with *Viburnum obovatum* Walter, cannot stand as a valid name in the genus *Ilex* and for the same reason *Ilex peragua* Trelease based on *Cassine Peragua* Linnaeus (Mant. II. 220 [1771] which also represents *V. obovatum* Walt., must be rejected. These two names being excluded from the genus *Ilex*, *Ilex vomitoria* Aiton of 1789 remains the valid name for the species if we consider Miller's *Cassine paragua* a homonym of *C. peragua* Linnaeus.

Ilex Macfadyenii, comb. nov. — *Prinos montana* Swartz, Prodr. 58 (1788); Fl. Ind. Occ. I. 622 (1797).—*Prinos lanceolatus* Macfadyen, Fl. Jam. I. 206 (1837).—*Prinos Macfadyenii* Walpers, Rep. I. 541 (1842).—*Ilex montana* Grisebach in Mem. Am. Acad. Sci. Arts, n. ser. VIII. 171 (Pl. Wright. I) (1860); Fl. Brit. W. Ind. 187 (1864), not Torrey & Gray.—Loesener in Nov. Act. Leop.-Carol. Akad. LXXVIII. 118 (Monog. Aquifol.) (1901).

WEST INDIES.

Ilex montana Grisebach is preoccupied by *I. montana* Torrey & Gray (apud Gray, Man. 276 [1848]) which is the oldest name for *I. monticola* Gray (Man. ed. 2, 264 [1856]). Gray changed the earlier name *I. montana* on account of *Prinos montanus* Swartz but as at that time the combination under *Ilex* had not yet been made, the change was not necessary and is not in accordance with our present rules, therefore, *I. montana* Torr. & Gray remains the correct name for the species which is called generally *I. monticola* Gray. If, however, *I. montana* Gray and *I. mollis* Gray are considered varieties of the same species, *Ilex montana* becomes *I. dubia* var. *monticola* Loesener (in Nov. Act. Leop.-Carol. LXXVIII. 485 [Monog. Aquifol.] [1901]), as *Prinos dubius* G. Don. (Gen. Syst. II. 20 [1832]) is the oldest valid name for *I. mollis* Gray.

Euscaphis japonica* var. *ternata, var. nov.

A typo recedit foliis trifoliolatis foliolis ovatis majoribus.

CHINA. Chekiang: South Yentang, *H. H. Hu*, No. 129, August 24, 1920.

As I have seen of this new form only a single fruiting branch with one pair of leaves which presents no other marked differences from typical *Euscaphis japonica* Dipp. except the 3-foliolate leaves and the larger ovate leaflets which are rounded at base and measure 7–9.7 cm. in length and 3.5–4.8 cm. in width, I hesitate to base a new species on such incomplete material, though the specimen presents a very distinct appearance. The leaflets are glabrous beneath except a few scattered hairs near the base of the midrib and a minute pilose pubescence on the petiolules of the lateral leaflets. The inflorescence is very large, about 15 cm. long excluding the peduncle which is 8 cm. long. Among the 43 specimens examined of *E. japonica* from China, Korea and Japan there is not a single specimen with 3-foliolate leaves except that occasionally the lower branches of the inflorescence are supported by one to 3 small leaflets.

***Acer stenolobum* (Sect. *Platanoides*), sp. nov.**

Arbor vel frutex; gemmae pluriperulatae perulis ciliatis ramuli tenues, annotini brunneo-grisei, vetustiores grisei, lenticellis paucis parvis instructi. Folia profunde trilobata, 3–4.5 cm. lata et 2.5–3.5 cm. longa, base fere truncata lobis subaequilongis angulo circiter 60° divergentibus, anguste oblongo-lanceolatis 4–7 mm. latis marginibus fere parallelis, integris obtuse acuminatis vel apicem versus paucidentatis, subtus ad basin in axillis nervorum villosa et margine initio sparse ciliata, ceterum glabra, laete viridia; petioli graciles 1.5–3 cm. longi, glabri. Flores andro-polygami, ut videtur lutescentes. graciliter et longe pedicellati, in corymbis glabris multifloris cum pedunculo gracili 1–2 cm. longo circiter 5 cm. longis et 3–4 cm. latis terminalibus in apice ramulorum foliis 4 instructorum; sepala 5, ovalia 1.5–2 mm. longa, obtusa, margine vel interdum tantum apice longe et sparse ciliata; petala lineari-oblonga vel oblonga, saepe inaequalia, sepalis subaequilonga vel paullo minora, glabra; stamina 5, inter lobos disci profunde lobati inserta, antheris ovalibus circiter 1–1.2 mm. longis; filamenta in floribus masculis sepalis duplo longiora, in flore fertili stamina sepalis subaequilonga; ovarium minute pilosulum; stylus ad medium fissus stigmatibus papillosis revolutis; in floribus masculis ovarium valde reductum stylis erectis brevibus basi connatis vel nullum; alae in fructibus juvenilibus suberectae basi vix constrictae et plus minusve incurvae. Fructus maturi desideratur.

CHINA. Shensi: west of Yen-an Fu, Wm. Purdom, No. 337, 1910.

This very distinct species belongs in the section *Platanoides* Pax, but is easily distinguished from all other species of this group by the small deeply 3-lobed leaves with very narrow lobes of nearly equal length, the lateral ones wide-spreading and sometimes nearly horizontal. It seems nearest to *A. pictum* Thunb., *A. truncatum* Bge. and *A. tenellum* Pax, but differs from them not only in the shape of the leaves, but also in the 5 exerted stamens, in the puberulous ovary and in the longer style.

***Acer cappadocicum* Gled. f. *rubrum* Nash** in 'Jour. New York Bot. Gard. xx. 87 (1919), nomen, as var.—*A. laetum* 2. *rubrum* Kirchner in Petzold & Kirchner, Arb. Musc. 193 (1864).—*A. colchicum rubrum* Hort. ex Kirchner, l. c. (1864), as synon.—*A. laetum* var. *rubrum* Ruprecht in Mém. Acad. Sci. St. Pétersb. sér. 7, xv. no. 2, 281 (Fl. Caucas.) (1869).—*A. pictum* var. *rubrum* Nicholson in Gard. Chron. ser. 2, xvi. 375 (1881).—*A. Lobelii* subsp. *laetum* var. *colchicum* f. *horticola* Pax in Bot. Jahrb. vii. 237 (1886).—*A. laetum* var. *colchicum* 3. *rubrum* hort. apud Schwerin in Gartenfl. XLII. 459 (1893).—*A. laetum* var. *colchicum* f. *horticola* Pax in Engler, Pflanzenr. iv-163, 48 (1902).—*A. cappadocicum* f. *horticola* Rehder in Sargent, Pl. Wilson. i. 86 (1911).

As the correct combination for this form of *A. cappadocicum* was published by Nash without the citation of any synonyms, the synonyms are cited here to show that there can be no doubt that the varietal name *rubrum* and not *horticola* has the priority.

Acer Buergerianum Miq. var. *trinerve*, var. nov.—*A. trinerve* Hort. apud Dippel, Handb. Laubholzk. II. 428, fig. 200 (1892), excl. syn. *A. pycnanthum* K. Koch.—Pax in Bot. Jahrb. xvi. 393 (1892); in Engler, Pflanzenr. iv-163, 12 (1902), in part.—Koehne, Deutsch. Dendr. 376 (1893).—*A. trifidum* Hort. angl. ex Dippel, Handb. Laubholzk. II. 428 (1892), as synonym.

This form differs from the type in its more deeply 3-lobed leaves, broader and often rounded or almost truncate at the base and with the lobes more strongly and unequally serrate, placed near or below the middle and spreading, while in typical *A. Buergerianum* the lobes are placed above the middle and point more or less distinctly forward and the margin of the leaf is usually entire or nearly entire. Occasionally one finds, however, on specimens of typical *A. Buergerianum*, e. g. on F. N. Meyer's No. 1427, collected June 4, 1915 near Nanking (herb. Arnold Arb.), leaves which agree exactly with those of the variety. I have seen neither flowers nor fruit of this form which is apparently a juvenile form of typical *A. Buergerianum* as suggested already by Koehne, Pax and Spaeth (in Mitteil. Deutsch Dendr. Ges. 1896, 25). Under cultivation it seems to retain its juvenile character and it is therefore advisable to distinguish it by a definite name from the type.

In the Herbarium of this Arboretum there is a specimen collected by G. Nicholson in 1880 in the Kew Arboretum and labelled "*A. trinervum* Sieb." which seems to show that this form was originally introduced by Siebold.

Acer Opalus var. *tomentosum*, comb. nov.—*A. neapolitanum* Tenore, Fl. Napol. II. 372, t. 100 (1820); Mem. sugli Acere, 13, t. 4 (1846).—*A. opulifolium* var. γ *tomentosum* Tausch in Flora, XII. 549 (1829).—Koch, Syn. Fl. Germ. 136 (1837), excl. "(β) lobis obtusis."—*A. obtusatum* var. *neapolitanum* Don, Gen. Syst. I. 649 (1831).—Pax in Bot. Jahrb. VII. 223 (1886), as subsp.; in Engler, Pflanzenr. iv-163, 58 (1902).—*A. Opalus* var. *neapolitanum* Henry in Elwes & Henry, Trees Gt. Brit. Irel. III. 664, t. 106, fig. 15 (1908).

The oldest varietal name applicable to *A. neapolitanum* Tenore is that given by Tausch who, though he refers *A. neapolitanum* as well as *A. obtusatum* Kitaibel to his variety *tomentosum* considers *A. neapolitanum* the type of his variety, as he enumerates Tenore's species as (α) *lobis acutis*" and *A. obtusatum* Kitaibel as "(β) *lobis obtusis*." Therefore there can be no doubt that if these two species are considered two distinct varieties the varietal name *tomentosum* has to be applied to *A. neapolitanum*, while *A. obtusatum* becomes *A. opalus* var. *obtusatum* Henry in Elwes & Henry, Trees Gt. Brit. Irel. III. 663 (1908).

Acer Hersii (Sect. *Macranthae*), sp. nov.

Arbor gracilis ad 8 m. alta; ramuli ab initio glabri, virides vel annotini et biennes lutescentes, nitiduli, vetustiores longitudinaliter albo-striati; gemmae stipitatae, perulis 2 exterioribus valvatis obtectae, perulis 2

interioribus accrescentibus. Folia ambitu ovata vel late ovata, 3-lobata, raro minoribus indivisis immixtis, basi cordata, minora ovata lobis brevissimis acutis et 6-10 cm. longa et 4-7 cm. lata, majora late ovata lobis longioribus acuminatis interdum lobis basalibus parvis instructa et 8-14 cm. longa et 7-13 cm. lata, lobo medio triangulari-ovato longe acuminato, lobis lateralibus circa medium divergentibus brevissimis acutis vel latissime ovatis acuminatis et interdum ad 3 cm. longis, toto margine inaequaliter et dupliciter serrata dentibus latis brevibus mucronulatis, supra laete viridia, glabra, subtus basin versus ad venas initio ut petioli tomento ferrugineo lanuginoso caduco vestita, mox glabra; petioli graciles, 2.5-6 cm. longi; flores (hermaphroditi tantum visi) in racemis 15-20-floris cum pedunculo circiter 1 cm. longo 4-6 cm. longis glabris; pedicelli 2-4 mm. longi; sepala oblonga, 4 mm. longa et 1.5 mm. lata, obtusa; petala sepalis subaequilonga, obovata; stamina 8, sepala dimidia aequantia, antheris ovalibus 1.25 longis quam filamenta paullo longioribus; ovarium leviter ferrugineo-pubescent, mox glabrescent; stylus brevis, vix 1 mm. longus, stigmatibus recurvis multo longioribus. Fructus in racemis densis pendentibus; pedicelli 3-6 mm. longis; samarae 1.6-2.2 cm. longae, fere horizontales, alis leviter sursum curvatis loculo planiusculo circiter duplo longioribus.

CHINA. Honan: Teng Feng Hsien, Yu Tai Shan, Erh Tsu an, alt. 800 m., *J. Hers*, No. 219 (type) April 23, 1919; Sunghsien, Sankuanmiao, alt. 1200 m., *J. Hers*, No. 533 (co-type; immature fruits); May 24, 1919; Lushish, Lao kiun Shan, alt. 200 m., *J. Hers*, No. 1169, September 21, 1919; Tsi Yuan Hsien, Tien tan shan, *J. Hers*, No. 1739 (sterile), September 21, 1921. Chili: without locality, *Pere Chanet*, 1919. Northern Shensi: Mt. Kiu-tou-san, *G. Giraldi*, July 14, 1897. North Central China: Mt. Kian-san, *Rev. Hugh*, 1897; "Thui-kio-tsuen," Mt. Kan-y-san" and Mt. Ngo-san, *Rev. Hugh*, 1899. Northern Hupeh "Ou-tan-scian," alt. 2050 m. *C. Silvestri*, No. 1370, September 1907; "Monte Kian-scian," alt. 2000 m., *C. Silvestri*, No. 1371, September 1907.

This new species belongs to the section *Macranthae* Pax and is closely related to *A. Davidii* Franch. and *A. laxiflorum* Pax. The first species is easily distinguished from it by the undivided, generally oblong-obovate leaves rounded or subcordate at the base and more densely rufous-pubescent beneath and on the petioles when young, and in the usually larger fruits on slenderer pedicels. The second species, *A. laxiflorum* Pax, differs from it chiefly in the caudate-acuminate, more closely and finely serrate leaves with acuminate teeth, glaucescent and glabrous beneath even when young and in the purplish and bloomy branchlets. Specimens of *A. Hersii* with larger more prominently lobed leaves have some resemblance to *A. tegmentosum* Maxim., but the leaves of that species are generally larger and broader with larger lateral lobes and a shorter middle lobe more sharply and doubly serrate with acuminate teeth and glabrous even when young and the anthers are suborbicular.

This new Maple is named in honor of Mr. Joseph Hers to whom the Arboretum is indebted for extensive and interesting collections and seeds of Chinese woody plant chiefly from the province of Honan, a region

hitherto almost unknown botanically. The Chinese name of this Maple "tsin pi tuan" meaning "green bark Linden" refers to the conspicuous smooth green bark of the branches. Young plants of this species raised from seed sent by Mr. Hers are growing in this Arboretum.

Aesculus discolor var *Koehnei*, nom. nov.—*Aesculus humilis* Koehne Deutsch. Dendr. 386 (1893), not Loddiges.—Rehder in Bailey, Stand. Cycl. Hort. i. 228 (1914), as to description.—*A. Pavia* var. *humilis* Voss, Vilmorin's Blumengärt. i. 184 (1894), as to description, not Mouillefert.¹—Rehder in Bailey, Cycl. Am. Hort. i. 32 (1900), as to description.—Schneider, Ill. Handb. Laubholzk. ii. 252 (1909), as to description.

This variety differs from the type in its lower stature forming a shrub only a few feet high, smaller leaflets 6–12 cm. long and smaller panicles usually less than 10 cm. long. The origin of this form is unknown; it was first described by Koehne from cultivated plants growing in Spaeth's nursery near Berlin and plants received from the same nursery are now growing in this Arboretum.

Aesculus turbinata Bl. var. *pubescens*, var. nov.

A typo recedit foliolis subtus tota facie in costa venisque densius breviter villosis, petiolo praesertim apicem versus satis dense pilosulo.

JAPAN. Hondo: "in silvis Aomori," *U. Faurie*, No. 5022 (type), June 1902; Nikko, *C. S. Sargent*; Sept. 2, 1892; Mt. Buko, Musashi, *K. Sakurai*, June 9, 1903.

HOKKAIDO: Mororan, *C. S. Sargent*, September 14 and 25, 1892; common in moist woods, *E. H. Wilson*, No. 7057, July 2, 1914.

This variety differs in the soft pubescent under side of the leaves from the type which is described by Blume as having puberulous petioles and the under side of the leaflets glabrous except bearded in the axils of the veins and puberulous on the midrib and often on the veins. In the type specimen and in Sargent's specimen from Mororan, collected on September 2, the pubescence is so dense that it could almost be called tomentose, while in the other specimen it is less dense. In the Japanese specimens of *A. turbinata* before me the leaflets beneath are either quite glabrous with the exception of axillary tufts of hairs or they represent the

¹ *Aesculus Pavia* var. *humilis* Mouillefert, Arb. Arbriss. ii. 709 (1894).—Voss, Vilmorin's Blumengärt. i. 184 (1894), excl. description.—Rehder in Bailey, Cycl. Am. Hort. i. 32 (1900) and in Bailey Stand. Cycl. Hort. i. 228 (1914), excl. description.—*Aesculus humilis* Loddiges apud Lindley in Bot. Reg. xii. t. 1018 (1826).—*Pavia humilis* G. Don apud Loudon, Hort. Brit. 143 (1830).—Sweet, Hort. Brit. ed. 2, 83 (1830).—G. Don, Gen. Syst. i. 653 (1831).—Spach, Hist. Vég. iii. 31, (1834).—*Pavia rubra* f. *humilis* Loudon, Arb. Brit. i. 470 (1838).—*Aesculus Pavia* var. *nana* Dippel, Handb. Laubholzk. ii. 404 (1892).

Of this form which is easily distinguished from *A. discolor* var. *Koehnei* by its narrower more deeply and irregularly serrate leaflets sparingly pubescent only on the veins and veinlets beneath I have seen specimens collected in 1880 by G. Nicholson in the Kew Arboretum under the names *Pavia rubra humilis pendula*, *Pavia pendula* and *Pavia pumila*, which agree well with Lindley's figures and his description of the pubescence of the leaflets as "subtus praecipue ad venas leviter pubescentia." As Loudon remarks his *A. rubra humilis pendula* (l. c.) is not a distinct variety, but only the var. *humilis* grafted high.

variety described above. The only specimens I have seen which agree exactly with Blume's description are specimens from trees cultivated at Kew, Segrez and in the former Ellwanger and Barry's nursery at Rochester, New York; the tree growing in this Arboretum has the petiole, midrib and veins glabrous, though it was raised from seed of the Rochester tree.

A plant received in 1913 from the nursery of H. A. Hesse in Weener, Germany, as *A. chinensis* has the leaflets densely pubescent beneath and belongs apparently to the variety here described.

Zizyphus jujuba Mill. var. *inermis*, comb. nov.—*Z. vulgaris* var. *inermis* Bunge in Mém. Sav. Etr. Acad. Sci. St. Pétersb. II. 88 (Enum. Pl. Chin. Bor. 14) (1833).—*Z. sativa* var. *inermis* Schneider in Sargent, Pl. Wilson. II. 212 (1914).

The oldest name under the genus *Zizyphus* of the tree named by Linnaeus *Rhamnus Zizyphus* is *Zizyphus jujuba* Miller (Gard. Dict. II. no. 1 [1768]), which antedates *Z. sativa* Gaertner (1788) and *Z. vulgaris* Lamarck (1789). The name for the species called by Lamarck *Z. jujuba* becomes *Z. mauritiana* Lamarck (Encycl. Méth. III. 318 [1789]) which must be considered conspecific; the chief differences Lamarck gives "feuilles moins larges, fruits oblongs et pointus" are scarcely of specific value, for the size of the leaves varies greatly in the species and the fruits though usually subglobose are occasionally oblong and pointed as in Merrill's No. 2779 from the Philippines. It certainly is unfortunate that the name used for more than one hundred years in Lamarck's sense should be transferred to another species, but I do not see how this can be avoided under our rules of nomenclature. Miller's name *Z. jujuba* is the oldest name for *Rhamnus Zizyphus* L. under *Zizyphus* and when Lamarck transferred *Rhamnus jujuba* L. to *Zizyphus* his combination cannot be considered valid on account of the earlier homonym of Miller. Miller could not use the specific name given by Linnaeus, as it duplicated the generic name, and being at liberty to choose any other name he chose the name used by older authors for the same plant; as his species are not based on those of Linnaeus' *Species plantarum* he was under no obligation to accept the specific name *jujuba* for the same species as Linnaeus did under *Rhamnus*, a species not mentioned at all in Miller's enumeration of the species of *Zizyphus*.

Rhamnus Alaternus f. *argenteo-variegata*, comb. nov.—*Rhamnus-Alaternus communis* 3. *argenteo-variegatus* Weston, Bot. Univ. I. 237 (1770).—*Rhamnus alaternus* var. 6. *albo-variegatus* Dumont de Courset, Bot. Cult. ed. 2, v. 259 (1811).—*Rhamnus Alaternus* c. *foliis argenteis* Loudon, Arb. Brit. II. 530 (1838).—*Rhamnus Alaternus* var. *variegata* Bean, Trees & Shrubs Brit. Isls. II. 330 (1914).

This form which is apparently an old inhabitant of gardens is figured by F. Schmidt (Oesterr. Baumz. III. t. 156, upper figure [1800]); it has leaves bordered with a broad irregular white margin. A similar form,

R. Alaternus f. *aureo-variegata* Dumont de Courset (l. c., as var.—*Rhamnus Alaternus communis* 2. *aureo-variegatus* Weston, l. c.) with yellow-margined leaves is also figured by Schmidt on the same plate (lower figure).

× *Ceanothus pallidus* Lindley in Bot. Reg. xxvi. t. 20 (1840).—K. Brandegee in Proc. Calif. Acad. ser. 2, iv. 214 (1894). (? *C. Delilianus*¹ × *ovatus* = *C. americanus* × *coeruleus*² × *ovatus*).—*C. Fontesianus* γ *cyaneus* Spach, Hist. Vég. II. 460 (1834).—*C. ovatus* 2. *flore cyaneo* H. Bollw. apud Kirchner in Petzold & Kirchner, Arb. Musc. 347 (1864).—*C. ovalis* × *thyrsiflorus* Koehne, Deutsch. Dendr. 396 (1893).—Schneider, Ill. Handb. Laubholz. II. 292 (1909).—*C. hybridus pallidus* Rehder in Bailey, Stand. Cycl. Hort. II. 696 (1914).—*C. intermedius* Hort. ex Koehne, l. c. (1893), as synonym.

For this plant which is apparently of hybrid origin, the parentage *C. ovatus* × *thyrsiflorus* has been suggested by Koehne and by Schneider, but I am unable to see any influence of *C. thyrsiflorus* Eschsch. There is no trace of the peculiar angular branches, of the rigid habit, the leathery leaves, the short pedicels and of other characters of that species perceptible in this plant, and, moreover, when this plant first appeared, *C. thyrsiflorus* was not yet introduced. There can be little doubt that *C. pallidus* Lindley is the same a Spach's *C. Fontesianus cyaneus*, as Lindley states that his plant was received from Messrs. Baumanns of Bollviller under the name of *C. ovatus* and Spach says that his var. *cyaneus* was raised like the following variety by the Baumanns from seed of his *C. Fontesianus* (*C. ovatus* Desf.).

¹× *Ceanothus Delilianus* Spach, Hist. Vég. II. 459 (1834).—K. Brandegee in Proc. Calif. Acad. Sci. ser. 2, iv. 213 (1894). (*C. americanus* × *coeruleus*).—*C. americanus* var. *floribus subcoeruleis* Godefroy in Ann. Soc. Hort. Paris. v. 302 (1829).—*C. pulchellus* Delile in Hort. Monsp. ex Spach, l. c. (1834), as synonym.—*C. Arnouldii* Carrière in Rev. Hort. 1872, 380.—*C. azureus* Lavallée, Arb. Segrez. 51 (1877), in part, not Desfontaines.—*C. azureus* var. *Arnoldii* Lavallée l. c. (1877).—*C. americanus* × *azureus* (*C. Arnouldii* h.) Koehne, Deutsch. Dendr. 395 (1893).—Schneider, Ill. Handb. Laubholz. II. 294 (1909).—*C. Dillenianus* Marchais in Rev. Hort. 1895, 351.—*C. hybridus* Hort. apud Rehder in Bailey, Cycl. Am. Hort. I. 265 (1900), in part.—*C. hybridus* "Arnoldii" Rehder, l. c. (1900).—*C. versailensis* Schneider, Ill. Handb. Laubholz. II. 294. (1909).

Judging from Spach's description I have no doubt that his statement that this plant is probably a hybrid of *C. azureus* is correct, and *C. americanus* is apparently the only species which could be the other parent. Therefore *C. Delilianus* will be the oldest binomial for the numerous hybrids raised between *C. coeruleus* Lag. (*C. azureus* Desf.) and *C. americanus*, of which may be cited as well known garden forms "Gloire de Versailles," "Léon Simon," "Sceptre d'azur," and "Le Géant."

² *Ceanothus coeruleus* Lagasca, Gen. & Spec. 11 (1816).—Loddiges, Bot. Cab. II. t. 110 (1821).—*C. azureus* Desfontaines, Tabl. Ecole Bot. ed. 2, 232 (1815), nomen nudum.—Ker in Bot. Reg. IV. t. 291 (1818).—K. Brandegee in Proc. Calif. Acad. Sci. ser. 2, iv. 193 (1894).—*C. bicolor* Humboldt & Bonpland apud Willdenow msc. in Roemer & Schultes, Syst. v. 300 (1819).

As pointed out already by Mrs. K. Brandegee (l. c.) the oldest valid name for this species is *C. coeruleus* Lag., as *C. azureus* Desf. published one year earlier is a nomen nudum.

The hybrid shows the influence of *C. ovatus* in the glabrous branchlets, the glabrous or nearly glabrous leaves and in their more oblong or elliptic not strictly ovate shape, while the blue color of the flowers must have come either from *C. coeruleus* or its hybrid with *C. americanus*, *C. Delilianus*. The scantiness or absence of pubescence and the rather large leaves with a tendency toward an ovate shape make it more likely that *C. Delilianus* is the other parent, for a cross with typical *C. coeruleus* would have produced a more pubescent plant with smaller distinctly oblong to elliptic leaves and a smaller inflorescence. The cross between *C. coeruleus* and *C. ovatus* may be represented by *C. Baumannii* Spach (Hist. Vég. II. 460 (1834)) of which I have seen no specimens.

× *Ceanothus pallidus* var. *roseus*, comb. nov.—*C. Fontanesianus roseus* Spach, Hist. Vég. II. 460 (1834).—*C. ovatus roseus* Carrière in Rev. Hort. 1875. 30, tab.—*C. azureus* var. *roseus* Lavallée, Arb. Segrez. 51 (1877).—*C. roseus* hort. (? *C. americanus* × *thyrsiflorus*) apud Koehne, Deutsch. Dendr. 395 (1893).—Schneider, III. Handb. Laubholz. II. 294 (1909).—*C. hybridus roseus* Rehder in Bailey, Cycl. Am. Hort. I. 265 (1900).—*C. hybridus* Hort. ex parte, ex Schneider, l. c. (1909).

This plant as well as *C. pallidus* was raised by Baumann from seed of *C. ovatus* and is apparently of the same origin; in habit, pubescence and shape of leaves there is little or no difference and the variation in color is not an unusually occurrence, as blue, violet and lilac flowers often produce forms with pink, or rose-colored or even red flowers. To this hybrid belongs the form known as "Marie Simon" with flesh-colored flowers.

× *Ceanothus pallidus* var. *plenus*, comb. nov.—*C. flore albo pleno* Jouin in Rev. Hort. 1891, 110.—*C. americanus* var. *flore albo pleno* Grosdemange in Rev. Hort. 1893, 475.—*C. azureus* f. *flore albo pleno* Voss, Vilmorin's Blumengart. I. 179 (1894).—*C. hybridus* "Albus plenus" Rehder in Bailey, Cycl. Am. Hort. I. 265 (1900).—*C. albus plenus* Anon. in Gard. LXXVII. 432, fig. (1913).

This form is similar in habit, pubescence and shape of leaves to the preceding variety, but has double white flowers, pink in bud. Its origin is unknown to me, but it possibly originated before 1890 with Simon-Louis of Plantières near Metz, who raised many other hybrids of *Ceanothus*.

Vitis Thunbergii Sieb. & Zucc. var. *sinuata*, comb. nov.—*V. Labrusca* α-*typica* d. *sinuata* Regel in Gartenfl. XXII. 204, t. 765, p. 1, (1873).—*Vitis Thunbergii* β *partita* Makino in Jour. Jap. Bot. I. 32 (1918).—*V. ficifolia* var. *Thunbergii* Nakai, Fl. Sylv. Kor. XII. 19, tab. 5 (1922), in part.

JAPAN: Buxen prov., K. Sakurai, August 17, 1910. KOREA. Quelpaert Island, common around Saishu on volcanic rocks, E. H. Wilson, No. 9371, October 28, 1917.

CULTIVATED SPECIMENS: Arnold Arboretum, September 7, 1921 (raised from seed of Wilson's No. 9371).

This variety differs from the type in the smaller, more deeply and usually 5-lobed leaves, with short and broad obtusish or rounded lobes

remotely and shallowly dentate or denticulate and much constricted below the middle by the wide rounded sinuses; on vigorous shoots the leaves are up to 8 cm. long, but on the flowering lateral branchlets they are usually only 3.5 to 5 or 6 cm. long. It has some resemblance to the Chinese *V. Thunbergii* var. *adstricta* (Hance) Gagnepain, but the leaves of that variety are more often 3-lobed and the lobes are acute or even acuminate. The rather small deeply divided leaves give to the plant a very graceful appearance and it is well worth cultivation as an ornamental vine.

Vitis Piasezkii Maxim. var. *Pagnuccii*, comb. nov.—*Vitis Pagnuccii* Romanet du Caillaud in Congress Geog. Toulouse (1884), ex Planchon in *Vigne Amér.* ix. 283 (1885).—Bailey, *Cycl. Am. Hort.* iv. 1956 (1902).—Schneider, Ill. Handb. Laubholz. II. 302, fig. 206g-g¹ (1909).—Bean, *Trees & Shrubs Brit. Isles*, II. 674 (1914).—*Ampelovitis Carrière* in *Rev. Hort.* 1888, 537, fig. 134.—*Ampelovitis Davidi* Carrière, l. c. 1889, 204 tab.—*Ampelopsis Davidii* Mottet in Nicholson & Mottet, *Dict. Prat. Hort.* I. 138 (1892).—*Ampelovitis Davidiana* Carr. ex Bailey, *Cycl. Am. Hort.* iv. 195b (1902), as synonym.—*Ampelopsis Davidiana* Mottet ex Bailey, l. c. (1902), as synonym.—*Vitis Davidiana* Hort. ex Bailey l. c. (1902), as synonym.

CHINA. Shensi: Ho-chen-hao, alt. 1300-1400 m., *A. David* (type locality, ex Planchon). Hancheng Hsien, W. Purdom, No. 372, 1910. Hupeh: north and south of Ichang, thickets, alt. 700-1600 m., *E. H. Wilson*, No. 215 (in part as to the fruiting specimen), September 1907. Honan: Hweihshien, Shansi, border, *J. Hers*, No. 721, June 19, 1919; Lushih, Hiung-eul-shan, alt. 1300 m., *J. Hers*, No. 868, October 9, 1919; Tsi-yuan Hsien, Tien-tan-shan, *J. Hers*, No. No. 1796, September 21, 1921.

CULTIVATED SPECIMENS: Vineyard T. V. Munson, Denison, Texas, *T. V. Munson*, August 18, 1890. Arnold Arboretum, No. 4565 (plant received from Vilmorin-Andrieux & Cie., Paris), August 23, 1906 and September 13, 1912 and October 10, 1908.

This variety differs from the type chiefly in the absence of the floccose tomentum on the underside of the fully grown leaves and on the young branchlets, otherwise I can find no difference; the variability in the shape of the leaves and the inflorescence and fruit are just the same. Extreme forms, those of the type with dense grayish or tawny floccose tomentum on the more strongly reticulate under side of the leaves and those of the variety with glaucescent under side quite glabrous at maturity except axillary tuft of hairs, look certainly different enough to be taken as distinct species, but intermediate forms exist, as Wilson's Nos. 126a and 248 and Her's Nos. 1214 and 1364, also Wilson's No. 215 referred to the variety is slightly pubescent on the veins and not as glabrous as the cultivated plant introduced from France. The typical form seems to be prevalent in the southwestern part of the range of the whole species and the variety in the northeastern part; among the numerous specimens before me from Hupeh only Wilson's No. 215 has glabrescent leaves, while three of the specimens from northern Honan belong to the variety and two to

the type and even those are more or less intermediate and from Shensi only the variety is known.

Camellia elongata, comb. nov.—*Thea elongata* Rehder & Wilson in Sargent, Pl. Wilson. II. 392 (1915).

According to the International rules of nomenclature the name *Camellia* has to be adopted, if *Camellia* and *Thea* are not considered generically distinct, as the first author, who united the two genera—Sweet in 1818—chose *Camellia* as the name for the genus. This was first stated clearly by Dr. Cohen Stuart in his dissertation on Tea Selection (in Mededeel. Proefstat. Thee. XL. 328 pp, pl. [1916]), which includes a critical synopsis of all the species of the genus (l. c. 57–133 [1916]), of which an English enlarged translation appeared in Bull. Jard. Bot. Buitenzorg, sér. 3, 1. 193–320, pl. 21–31 [1919]). In a letter dated June 27th, 1922, Dr. Cohen Stuart calls my attention to two specimens not seen by my colleague and me when we described the species, collected by E. Faber on Mount Omei in 1887 which he refers to *Camellia elongata*, namely No. 76 (in herb. Kew and Berlin), and No. 345 (in herb. Kew), also an anomalous one, probably by Faber (in herb. Berlin); he adds: “No. 345 will be of special interest to you as it bears fruit. These are 14 mm. long, 11 mm. thick, pear-shaped, glabrous, opening from the apex with sharp-edged lobes; the seeds are too much shriveled to allow of a description.”

Viburnum Sargentii f. *flavum*, forma nov.

A typo recedit fructi flavo, antheris flavis, foliis subtus tantum ad costam nervosque et saepe sparse ad venulas pilosis.

Cultivated at Highland Park, Rochester, New York, and at the Arnold Arboretum specimens examined: Highland Park, Rochester, New York, *J. Dunbar*, August 30, 1922.

This handsome form of *V. Sargentii* Koehne is distinguished from the type by its larger light yellow or amber-colored fruit pellucid when fully ripe, short-ellipsoidal or obovoid-ellipsoidal and 9–11 mm. long and 8–9 mm. across. In the pubescence of its leaves it is intermediate between the type and f. *calvescens* Rehder, being pilose chiefly on the midrib and veins only.

It was raised together with typical *V. Sargentii* at the Arnold Arboretum from seed sent in the autumn of 1904, by the Japanese botanist Uciyama from Korea to the Arboretum. Plants were sent latter to the Park Department at Rochester, New York, where it seems to have done better than in this Arboretum. It apparently fruits more profusely than the type and is indeed a striking plant when covered with its large pendent clusters of amber-colored fruit and seems superior as an ornamental shrub to *V. Opulus* f. *xanthocarpum*.

(To be continued)

TWO NEW ASIATIC POPLARS

ALFRED REHDER

***Populus Purdomii*, spec. nov.**

Arbor; ramuli juveniles teretes vel subteretes, glabri, annotini ochracei vel pallide flavo-brunnei; gemmae acutae, glabrae, viscosae. Folia ovata, vel anguste ovata, 10–13 cm. longa et 6–8.5 cm. lata, interdum ad 16 cm. longa et ad 13 cm. lata, ea turionum saepe oblongo-ovata ad 25 cm. longa et ad 15 cm. lata, acuminata, basi rotundata et plus minuse subcordata, margine denticulato-serrata vel crenato-serrata dentibus brevibus mucronulatis, supra glabra margine interdum ciliolato excepto, opace viridia nervis flavescentibus, subtus albescentia, sparse pilosula vel densius ad nervos et venulas, interdum glabra; nervis et nervulis distinctis elevatis; petioli 2.5–5 cm. longi, ei turionum plerique paullo breviores. Amenta tantum fructifera visa, ad 11 cm. longa glabra; capsulae sessiles vel subsessiles, glabrae, globoso-ovoideae circiter 7 mm. longae, 2–3-valvae, basi perianthio parvo irregulariter lobato cinctae.

CHINA. Shensi: Tai-pai-shan, *W. Purdom*, No. 1111 (type), 1910, No. 1110 (sterile), 1910. Southwestern Kansu: near Kagoba, alt. 2300–2600 m., *F. N. Meyer*, Nos. 1816, 1993, (sterile) October 30, 1914; Yin kuan dien, *F. N. Meyer*, No. 1945 (sterile), September 23, 1914. Also the following specimens seem to belong here: Szechuan: Lungan Fu, Tu-ti-liang-shan, alt. 2300–3000 m., *E. H. Wilson*, No. 4578, August 1910, west of Kuan Hsien, Pan-lan-shan, alt. 2600–3300 m., *E. H. Wilson*, No. 4346, October 1910.

CULTIVATED. Chico, Calif., Field Exper. Station of U. S. Department of Agriculture, under S. P. I. No. 39900 (from Kagoba,) *C. R. Howard*, April 2, 1916. Arnold Arboretum (plant received from Chico under S. P. I. No. 39900), *A. Rehder*, August 22, 1922.

This new species seems to be most nearly related to *P. suaveolens* Fischer and to *P. szechuanica* Schneider, but it differs from both in its prevailing 2-valved capsules. In the shape and size of its leaves it resembles the latter, but the leaves are generally smaller and somewhat narrower, and the branchlets and even the more vigorous shoots are terete and not angled. From *P. suaveolens* it may be further distinguished by the larger, more coarsely glandular-serrate leaves always rounded and more or less subcordate at base and by the usually duller colored branchlets. The specimens from Shensi and Kansu have the under side of the leaves more or less pubescent but *Purdom's* No. 1110 is quite glabrous like the specimens from Szechuan; the pubescence, however, seems variable, as in *Meyer's* No. 1816, one leaf has the midrib, veins and veinlets distinctly pilose, while two other leaves attached to the same branch are glabrous and one is slightly pilose.

Photographs taken by *F. N. Meyer* near Kagoba in 1914, under Nos. 12170 and 13165, are in the collection of photographs of this Arboretum.

Populus Purdomii was introduced by *F. N. Meyer*, from Kagoba and subsequently distributed by the U. S. Department of Agriculture under

P. S. I. No. 39900 as *Populus Przewalskii*, but that species has according to the description elliptic leaves acute at base and only 3.5–5 cm. long and pubescent capsules becoming glabrate. In the cultivated plant of *P. Purdomii* the smaller leaves and those at the base of the shoots are slightly pilose beneath, those of the more vigorous shoots are nearly glabrous; on the upper surface they are dull green and rugulose and the midrib above and the petioles are red.

***Populus koreana*, sp. nov.**

Arbor ad 25 m. alta; ramuli initio viscido-glandulosi, teretes, annotini pallide brunnei; stipulae triangulares, acuminatae, 5–6 mm. longae et 3–4 latae; folia turionum elliptico-ovata vel elliptica ad ovato-oblonga, 7–15 cm. longa et 4.5–8.5 cm. lata, interdum majora, breviter acuminata, acumine rarissime torto, basi pleraque rotundata rarius subcordata, ea ramulorum brevium elliptica-oblonga vel oblongo-lanceolata, 4–12 cm. longa et 1.8–3.5 cm. lata, rarius majora, acuta vel acutiuscula, basin versus angustata et late cuneata vel rotundata, crenato-serrulata dentibus glanduloso-mucronulatis, supra rugulosa vel rugosa, glabra vel initio ad costam mediam puberula intense viridia, subtus albescentia, glabra vel interdum in foliis ramulorum brevium ad costam et venas ut petiolus minute pilosula; petioli 0.5–1 cm. longi, glabri, in ramulis brevibus ad 1.5 cm. longi et interdum minute pilosuli. Flores et fructus non visi.

KOREA. North Heian; foot of Mt. Hakuba, side of streams, *E. H. Ison*, *Wi* No. 8822 (type) July 24, 1917; Pakadong, Yusan district, *E. H. Wilson*, No. 10669, September 1, 1918; from around Shingishu on Yalu River, cultivated at forestry station, *E. H. Wilson*, No. 8787, July 16, 1917. North Kankyo: Funei, side of streams, abundant, *E. H. Wilson*, No. 8890, August 14, 1917; Mozan to Jyosohya, water-courses, not common *E. H. Wilson*, No. 8935, August 17, 1917.

Cultivated: Arnold Arboretum, under No. 10825; specimens collected: October 28, 1920, September 20, 1921.

Though the flowers and fruits of this new Poplar are unknown it is so distinct in its vegetative characters that there can be no doubt, that it represents an undescribed form. It is apparently most nearly related to *P. Maximowiczii* Henry and I was at first inclined to consider it a variety of that species, but Mr. Wilson who paid special attention to the Poplars while in Korea says that it is quite different from *P. Maximowiczii* and always easily distinguished chiefly by its viscid-glandular young shoots. and that it is a smaller tree of different habit and of more southern distribution. From this new species *P. Maximowiczii* differs chiefly in its puberulous young branchlets, glabrous but not viscid-glandular only in younger seedling plants, in the broader leaves more or less pubescent beneath, rounded or subcordate at base and nearly always with a peculiar twist at the apex, in the generally longer puberulous petioles and in the brighter yellow or orange-yellow color of the mature branchlets. The third Korean species, *P. Simonii* Carrière, produces sometimes on vigorous shoots larger leaves which resemble those of the other two species, but it

is always easily distinguished by the glabrous angular shoots and the perfectly plane and smooth upper surface of the leaves.

Young plants of *P. koreana* raised from cuttings brought by Mr. Wilson from Korea, are growing in this Arboretum and are very handsome with their large bright green leaves marked with a conspicuous red midrib and nearly white on the under side.

BIBLIOGRAPHICAL NOTES

ETHELYN M. TUCKER

Nouveau Duhamel. Upon the publication of my note on "Nouveau Duhamel" in this *Journal* vol. ii, no. 3, I received a letter from Miss Alice Atwood of the Bibliographical staff of the Department of Agriculture at Washington, calling attention to references which had escaped my notice, which seem to prove that the work appeared in 83 livraisons instead of in 80 as stated by me, and that volume i was published from 1800 to 1801. To quote in part from this letter: "An article by Bouchard-Huzard 'Note bibliographique sur le Traité des arbres et arbustes et sur le Traité des arbres fruitiers, par Duhamel du Monceau' in the *Journal de la Société impériale et centrale d'horticulture de France*, v. 12, 1866, states on pages 472-473 that the work appeared in 83 livraisons (1800-1819). Konig and Sims' *Annals of botany*, vol. i. no. 1, p. 69 in the 'Retrospect of botanical literature for 1801-03' speaks of the new edition of Duhamel's Traité, begun in 1800." From these references and others since discovered it seems clear the "Nouveau Duhamel" was issued in 83 livraisons from 1800 to 1819. I gladly take the opportunity to make this correction.

Mouillefert. Traité des arbres & arbrisseaux. From a bibliographical point of view it is always of interest to know the form in which a work originally appeared; if in parts, coming out at more or less irregular intervals during a number of years, when those parts were issued, how many pages they contained, whether there were covers, and whether those covers gave dates, which unfortunately they often do not. In the case of botanical works it is of great importance as involving questions of priority, and it is quite deplorable that in the majority of cases when such volumes are bound the covers are destroyed and valuable information lost altogether or recovered at the expenditure of much painstaking labor and time. Mouillefert's "Traité des arbres & arbrisseaux forestiers, industriels et d'ornement cultivés ou exploités en Europe et plus particulièrement en France donnant la description et l'utilisation de plus de 2400 espèces et 2000 variétés," issued in 38 parts, is bound in 3 vols., without covers. Texte, partie 1 (Rénunculacées à Légumineuses) 688 pp.; partie ii (Térébinthacées à Graminées) pp. 689-1403; and Atlas, 195 plates. Paris. 1892-

1898. It would be interesting to learn whether there were covers as originally issued, and if so, whether those covers were dated. Singularly enough Just's *Botanischer Jahresbericht* makes no mention of Mouillefert's "Traité" until the announcement of the complete work in 1898.

While not containing new species the "Traité" is interesting as giving many new varieties and it is gratifying to be able to quote dates and pages of parts as given in a letter written to Mr. Alfred Rehder by the publisher Paul Klincksiek, August 19, 1903, in response to a request for them for the Arboretum copy

Part	1	signatures	1-2	Jan. 7, 1891
"	2	"	3-4	Jan. 28, 1891
"	3	"	5-6	Mar. 7, 1891
"	4	"	7-8	Mar. 31, 1891
"	5	"	9-10	July 15, 1891
"	6	"	11-12	July 15, 1891
"	7	"	13-14	July 15, 1891
"	8	"	15-16	July 30, 1891
"	9	"	17-18	Nov. 24, 1891
"	10	"	19-20	Nov. 24, 1891
"	11	"	21-22	Jan. 12, 1892
"	12	"	23-24	Mar. 5, 1892
"	13	"	25-26	April 23, 1892
"	14	"	27-28	July 8, 1892
"	15	"	29-30	Nov. 19, 1892
"	16	"	31-32	May 16, 1893
"	17	"	33-34	Aug. 18, 1893
"	18	"	35-36	Oct. 7, 1893
"	19	"	37-38	Mar. 13, 1894
"	20	"	39-40	Mar. 13, 1894
"	21	"	41-42	June 11, 1894
"	22	"	43-44	Oct. 2, 1894
"	23	"	45-46	Jan. 7, 1895
"	24	"	47-48	April 23, 1895
"	25	"	49-50	Aug. 12, 1895
"	26	"	51-52	Aug. 12, 1895
"	27	"	53-54	Dec. 28, 1895
"	28	"	55-56	Feb. 20, 1896
"	29	"	57-58	July 7, 1896
"	30	"	59-60	Sept. 18, 1896
"	31	"	61-62	Dec. 3, 1896
"	32	"	63-65	Feb. 20, 1897
"	33	"	66-69	Aug. 4, 1897
"	34	"	70-73	Nov. 6, 1897
"	35	"	74-77	Jan. 10, 1898
"	36	"	78-81	Mar. 2, 1898

Part 37	signatures	82-85	June 8, 1898
" 38	"	86-88	Oct. 5, 1898 (containing title and indexes for text and plates).

From this citation it appears that nearly one half of vol. i (pages 1-320) was issued in 1891, a year earlier than the date upon the title page.

Voss. Vilmorin's blumengärtnerei. The full title of this well-known work reads: "Vilmorin's Blumengärtnerei; beschreibung, kultur und verwendung des gesamten pflanzenmaterials für deutsche gärten. Dritte, neubearbeitete auflage unter mitwirkung von A. Siebert, herausgegeben von A. Voss. Mit 1272 textabbildungen und 400 bunten blumenbildern auf 100 farbendrucktafeln." 2 bde. Berlin. 1896. Bd. 1, pp. viii, 1264; bd. 2, pp. 244, 78.

Though published as a third edition to "Vilmorin's Illustrierte blumengärtnerei," it may be regarded as an entirely new work, having little in common with the first and second editions except the title. The preface in bd. 1 states that the task of editing a new edition of Vilmorin's celebrated "Blumengärtnerei," of which two editions of many thousands of copies have been distributed among gardeners and plant lovers, is an extraordinarily difficult one, the more so as the publisher, Dr. Parey, wishes to present more than a revision and a supplement. Instead of the original alphabetical arrangement of botanical names he proposes an arrangement by families and genera and an enlargement from the entire plant material in German gardens. In order to do this the editor, A. Voss, spent many months in practical study in the Frankfurt Palm-garden, in Stuttgart, Berlin, etc., and after six years labor the work is brought to a close. In regard to nomenclature the work is much more thorough and exact than most works on the botany of cultivated plants; the author, as a follower of O. Kuntze, has tried to apply consistently the law of priority and therefore found it necessary to create a considerable number of new names and new combinations, chiefly of varieties. To fix the date of publication of these new names the statement is made in the preface that bd. 1 was "im druck von neujahr 1894 bis August 1895." To make the date of the appearance of the first part more specific, we find in *Gartenflora* for April 1894, p. 223, that the first heft of the work which has been in preparation for many years has at last appeared, and that the entire work in 2 vols. will be issued in 50 lieferungen. *Gartenflora* also adds that of the original work little remains, but the name and many "clichés." While the original contained only plants growing in the open air, the new work includes exotic and hot house plants. *Botanische zeitung* for June 1, 1894, on page 176, states that lieferung 1 consists of 48 pages.

On the reverse of the title-page of bd. 1 of the Arboretum copy is written in pencil, "Published in 50 parts, one every two weeks. Pages 1-832 published in 1894; pp. 833-1264 in 1895." Though diligent search has failed to reveal the source of this information it is believed to be

correct as it was added by Mr. Alfred Rehder in compiling the Bradley Bibliography, and it is more than likely that it was obtained from the editor himself.

The dates of band 2 of "Blumengärtnerei" concern us but little since it contains no new names and no descriptions, but it is interesting to find in *Botanische zeitung* for Dec. 16, 1895, on page 391 the announcement of pages 1-128; it was doubtless completed in 1896 the date of the preface and the title-pages.

Willmott. The Genus Rosa. Recognized in every age and in all countries as the Queen of flowers, the rose has been the subject of much literature. Among the many books of roses of recent years Miss Ellen Willmott's "Genus Rosa, drawings by Alfred Parsons," stands out pre-eminently, by virtue of its comprehensiveness, the accuracy of descriptions and the delicacy and beauty of its colored plates. In her preface Miss Willmott says "I have aimed principally at giving all the evidence I could collect from every available source. I can hardly hope to have presented many facts not mentioned by previous writers, but I have at least taken great pains to ensure accuracy, and to verify and give references for every statement I have made." To this carefully collected evidence are added not a few descriptions of new species, especially of Chinese roses by J. G. Baker.

The covers of the twenty-five parts in which the work was issued from 1910 to 1914, are a joy and delight alike to the cataloguer, bibliographer and to the student of roses, giving the year in which each part was published (pts. vii-xxv have also month and day), and on the back cover of the last part a concise list of all the parts with month and day of the appearance of each.

Perhaps in some libraries "The Genus Rosa" may exist only as two bound volumes, paged continuously, without covers, the title-page of each bearing the date 1914, and the only indication of an earlier date being an additional title-page for 1910 in volume i, which by itself is a little confusing.

It seems therefore worth while to put full information on record, in the hope that it may help some lover of Roses.

Vol. i

Pt.	1	pp.	i-viii,	1-22	September 15, 1910
"	2	"	23-42		October 19, "
"	3	"	43-56,	i-xxvi	November 14, "
"	4	"	57-76		December 14, "
"	5	"	77-100		January 14, 1911
"	6	"	101-132		February 14, "
"	7	"	133-156		March 14, "
"	8	"	157-174		April 12, "
"	9	"	175-196		May 12, "

Pt. 10	pp. 197-210	June	14, 1911
" 11	" 211-230	July	14, "
" 12	" 231-244	August	14, "

Vol. ii

Pt. 13	pp. 245-266	September	20, 1911
" 14	" 267-280	October	13, "
" 15	" 281-300	November	14, "
" 16	" 301-322	December	14, "
" 17	" 323-340	January	15, 1912
" 18	" 341-358	February	24, "
" 19	" 359-376	April	4, "
" 20	" 377-396	June	7, "
" 21	" 397-414	June	26, "
" 22	" 415-446	July	16, "
" 23	" 447-466	September	19, "
" 24	" 467-482	October	19, "
" 25	" 483-552, ix-xvi, xxvii	March	14, 1914

From the foregoing citation it is seen that though the volumes are dated 1914, part xxv is the only one which was not actually published previous to that date.

ERRATA AND ADDENDA

Page 14, line 8 for 1928 *read* 1828

“ 15, line 8 for in *read* before

“ 16, line 13 from below for *glandulosa*, comb. nov. *read* *glandulosa*
Farwell in Rep. Mich. Acad. Sci. XXI, 366 (1920).

“ 74, line 1 under No. 75 for Fernald *read* Fernald & Wiegand¹

“ 86, under CONNECTICUT *add* *pedicellaris and serissima*

“ 87, under MAINE *strike out candida and add pedicellaris and pyrifolia*

“ 87, under MASSACHUSETTS *omit amygdaloides*

“ 88, “ VERMONT *omit amygdaloides and add pedicellaris*

“ 89, “ LABRADOR *add reticulata*

“ 89, “ NEW BRUNSWICK *add glaucophylloides and longifolia*

“ 90, “ NEWFOUNDLAND *add arctophila,* cryptodonta, pedicellaris*
and serissima

“ “ lines 2-3 for *brachypoda read brachycarpa*

“ “ under QUEBEC for *chlorolepis read* chlorolepis and for fuscescens*
var. hebecarpa read fuscescens var. hebecarpa and add brachy-*
carpa and pedicellaris

“ 94, lines 1-3 above footnote 1 should be stricken out

“ 95, lines 1-6 from above should be stricken out

¹ For this and the following corrections we are indebted to Professor M. L. Fernald.

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